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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 11, 1985 Volume 1055 Number 2

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

May 7, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 8, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,333,179 through 4,334,324

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,347,624, Re. S.N. 646,168, Filed Aug. 31, 1984, Cl. 250/445T, X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES, Edgar Tschunt, Owner of Record: *Siemens Aktiengesellschaft, Berlin and Munich, Germany,* Attorney or Agent: James van Santen, et al., Ex. Gp.: 256

4,436,519, Re. S.N. 728,623, Filed Apr. 29, 1985, Cl. 604/175, REMOVABLE HEMOSTASIS VALVE, William J. O'Neill, Owner of Record: *Argon Medical Corp., Athens, Tex.,* Attorney or Agent: Lawrence S. Levinson, et al., Ex. Gp.: 336

4,477,687, Re. S.N. 727,001, Filed Apr. 22, 1985, Cl. 136/229, THERMOCOUPLE AND METHOD OF MAKING THE THERMOCOUPLE AND OF MOUNTING THE THERMOCOUPLE ON A HEAT EXCHANGER TUBE, Philip F. Finney, Owner of Record: *Inventor,* Attorney or Agent: Edmond T. Patnaude, et al., Ex. Gp.: 223

4,504,000, Re. S.N. 727,929, Filed Apr. 26, 1985, Cl. 223/104, SEWING BOX, John S. Doyel, Owner of Record: *Inventor,* Attorney or Agent: Ivan S. Kavrukov, et al., Ex. Gp.: 247

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,360,683, Reexam. No. 90/000,773, Requested: May 6, 1985, Cl. 315/209, SOLID-STATE PULSE GENERATOR FOR ELECTRIC-DISCHARGE MACHINING, Kiyoshi Inoue, Owner of Record: *Inventor,* Attorney or Agent: Herbert Dubno, Ex. Gp.: 220, Requester: Colt Industries Operating Corp., W. Hartford, Conn.

3,900,886, Reexam. No. 90/000,779, Requested: May 13, 1985, Cl. 358/82, SONIC COLOR SYSTEM, Jan R. Coyle, et al., Owner of Record: *Inventors,* Attorney or Agent: Newton H. Lee, Jr., Ex. Gp.: 260, Requester: Atari Holdings, Inc., New York, N.Y.

4,074,176, Reexam. No. 90/000,778, Requested: May 13, 1985, Cl. 318/371, MOTOR PROTECTOR, Harry G. Parke, Owner of Record: *Marine Electric Corp., Brooklyn, N.Y.,* Attorney or Agent: Wender, Murase & White, Ex. Gp.: 217, Requester: Wender, Murase, et al., Washington, D.C.

4,124,899, Reexam. No. 90/000,774, Requested: May 2, 1985, Cl. 307/465, PROGRAMMABLE ARRAY LOGIC CIRCUIT, John M. Birkner, et al., Owner of Record: *Monolithic Memories, Inc., Sunnyvale, Calif.,* Attorney or Agent: Skjerven, Morrill, et al., Ex. Gp.: 254, Requester: Walter J. Madden, Jr., Skjerven, et al., Santa Clara, Calif.

4,340,682, Reexam. No. 90/000,780, Requested: May 13, 1985, Cl. 524/507, ADHESIVE CONSISTING ESSENTIALLY OF AN ISOCYANATE TERMINATED RICINOLEATE PREPOLYMER AND A CHLORINATED POLYVINYL CHLORIDE, Norris R. Legue, et al., Owner of Record: *Synthetic Surfaces, Inc., Scotch Plains, N.J.,* Attorney or Agent: John N. Bain, Ex. Gp.: 151, Requester: Lord Corp., Arlington, Va.

4,387,440, Reexam. No. 90/000,777, Requested: May 10, 1985, Cl. 364/900, MODEM CONTROL CODE MULTIPLEXING, Michael D. Eaton, Owner of Record: *Business Computer Corp., Sunnyvale, Calif.,* Attorney or Agent: Limbach, Sutton, et al., Ex. Gp.: 230, Requester: Racal Data Communications, Inc., Milpitas, Calif.

4,428,768, Reexam. No. 90/000,775, Requested: May 3, 1985, Cl. 75/10, PROCESS FOR THE RECOVERY OF PLATINUM GROUP METALS FROM REFRACTORY CERAMIC SUBSTRATES, Joseph G. Day, Owner of Record: *Johnson Matthey Co., London, England,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 110 Requester: Owner

Examination

Pursuant to the provisions of 37 C.F.R. §§10.5, 10.6 and 10.7, an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on Tuesday, Oct. 8, 1985.

With the exception of those persons who actively served four years in the examining corps of the Patent and Trademark Office for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must pursuant to the noted rules, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by 37 C.F.R. §10.14, which does not require the passing of an examination.

37 C.F.R. §10.6(d) provides, in part, that, "[A]ny officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office . . . [but,] an officer or employee whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of . . . [part 10 of 37 C.F.R.] may be registered to practice before the Office to the extent necessary to carry out his or her official duties." If a person is an officer or employee of the United States who is not disqualified for registration under 37 C.F.R. §10.6(d) when that persons applies to take the examination, that person's application for registration *must* be accompanied by his or her supervisor's *verified statement* that his or her official duties as a United States officer or employee require him or her to prepare and prosecute applications for patent. If, after applying, a person becomes an officer or employee of the United States, and is not disqualified for registration under 37 C.F.R. §10.6(d), that person must submit the same verified statement from his or her supervisor, preferably promptly upon his or her employment. After passing the examination, a person may be considered eligible for registration. If a person is disqualified for registration under 37 C.F.R. §10.6(d) when he or she applies, or becomes so disqualified after applying, but before he or she is registered, approval of his or her application to take the examination will be subject to the following conditions:

1. If the person passes the examination, that person will not be registered so long as he or she remains disqualified for registration under 37 C.F.R. §10.6(d). However, if within one (1) year from the date notification of passing is mailed, that person's status changes and he or she is no longer disqualified under 37 C.F.R. §10.6(d), that person will be considered eligible for registration upon satisfactory proof of his or her change in status.
2. If a person has not become registered within one (1) year from the date notification of passing is mailed, that person may not become registered thereafter except upon taking and passing another regulary scheduled examination.

Under 37 C.F.R. §10.7(b), persons seeking registration must submit "satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters . . . ." The initial submissions of many persons are inadequate, and often they must be supplemented before applicants are approved to take the examination. To afford adequate time to present a satisfactory supplemental showing, it is recommended that persons file their applications early, preferably at least two months before the July 31, 1985 final date set out *infra.* All supplemental showings of qualifications and all applications received after July 31, 1985 will be consid-

ered only in connection with their admission to the next succeeding examination.

The examination will be given under the supervision of the Office of Personnel Management (formerly Civil Service Commission), and may be taken at specific locations in which the Office of Personnel Management conducts examinations.

July 31, 1985 is the final date for receipt in the Patent and Trademark Office of applications to take the examination together with a $75 fee and all necessary satisfactory showings required by 37 C.F.R. §§10.7(a) and (b).

Application blanks may be obtained from the Office of Enrollment and Discipline, Bldg. 3, 10th Floor, Rm. D23, Crystal Plz., Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Office of Enrollment and Discipline.

CAMERON WEIFFENBACH,
May 14, 1985. *Office of Enrollment and Discipline.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before July 12, 1985:

Bogatie, George E., 3728 S.E. Dana Dr., Bartlesville, Okla. 74006.
Marcus, Michael S., 9504 Yawl Ct., Burke, Va. 22015
Schecter, Manny W., 6166B Essex House Sq., Alexandria, Va. 22310
Schultz, William H., 4920 Redford Rd., Bethesda, Md. 20816

CAMERON WEIFFENBACH,
May 15, 1985. *Director Office of Enrollment and Discipline.*

Removal from Register

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on Nov. 19, 1984, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

Edward J. Connors, Jr., P.O. Box 10929, 909 Washington Blvd., Stamford, Conn. 06904
Harrison E. McCandlish, LeBlanc, Nolan, Shur & Nies. 1911 Jeff. Davis Hwy., Arlington, Va. 22202
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John Stan, Department of the Navy, Naval Undersea Ctr., Code 96, San Diego, Calif., 92132
J. Robert Stapleton, Coffee & Sweeney, Suite 3240, 20 N. Wacker Dr., Chicago, Ill., 60606
Horace Avery Stearns, 2948 E. Martin Ct., Route 10, Midland, Mich., 48640
William C. Steffin, Lyon & Lyon, 800 Wilshire Blvd., Los Angeles, Calif., 90017
Charles A. Stein, J. P. Stevens and Co., Inc., 141 Lanza Ave., Garfield, N.J., 07026
Walter H. Steinbauer, Jr., Firestone Tire & Rubber Co., Patent Dept., 1200 Firestone Pkwy., Akron, Ohio, 44317
Charles F. Steininger, P hillips Petroleum Co., Room 208, P.L. Bldg., Bartlesville, Okla., 74004

Walter J. Steinkraus, Loctite Corp., 705 N. Mountain Rd., Newington, Conn., 06111
Robert Jay Steinmeyer, Beckman Instruments, Inc., 2500 Harbor Blvd., Fullerton, Calif., 92634
Adelbert A. Steinmiller, Blenko, Buell, Ziesenheim & Beck, 301 Fifth Avenue Bldg., Pittsburgh, Pa., 15222
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Samuel Sterman, 56 Commodore Rd., Chappaqua, N.Y., 10514
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Richard W. Sternberg, Sr., Monsanto Co., E Bldg., Rm. 138, 800 N. Lindbergh Blvd., St. Louis, Mo., 63122
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Lloyd B. Stevens, Jr., Monsanto Research Corp., Station B - Box 8, Dayton, Ohio, 45407
Clark B. Stewart, P.O. Box 27864, Tempe, Ariz., 85282
Richard C. Stewart, Kenyon & Kenyon, 59 Maiden La., New York, N.Y., 10038
Melvin Robert Stidham, Suite 352, Holiday Plz., 1050 Northgate Dr., San Rafael, Calif., 94903
Frederick A. Stolzle, Jr., Cole, Holladay, & Stolzle, P.O. Box 2864, Suite 410, 343 Riverside Mall, Baton Rouge, La., 70821
Wilfred Schafer Stone, Fitzgibbon, Roehrig, Greenawalt & Stone, 135 S. La Salle St., Chicago, Ill., 60603
Roy G. Story, RR Box 5388, Spirit Lake, Iowa, 51360
John L. Stoughton, P.O. Box 906, White Stone, Va., 22578
Ferris M. Stout, 145 Witherspoon St., Princeton, N.J., 08640
Harold T. Stowell, Cameron, Kerkam, Sutton, Stowell & Stowell, Suite 900, Century Bldg., 2341 Jeff. Davis Hwy., Arlington, Va., 22202
Donald F. Straitiff, Westinghouse Elec. Corp., Pat. Dept., Churchill Borough, Pittsburgh, Pa., 15235
Steven J. Stringfellow, P.O. Box 2607, Station A., Champaign, Ill., 61820
Louis J. Strom, ESS, Inc., 9613 Oates Dr., Sacramento, Calif., 95827
Kenneth E. Stroup, Jr., Allied Corp., P.O. Box 2245R, Columbia Rd. & Park Ave., Morristown, N.J., 07960
Andrew John Stuchly, 8162 S. Homan Ave., Chicago, Ill., 60652
Philip Subkow, 1367 Woodruff Ave., Los Angeles, Calif. 90024
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John A. Swanson, Union Special Corp., 400 N. Franklin St., Chicago, Ill., 60610
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Lester M. Swingle, 300 E. Church St., Apt. 1019, Orlando, Fla., 32801
Judith L. Sykes, Kenyon & Kenyon, 59 Maiden La., New York, N.Y., 10038
Donall H. Sylvester, 1244 N. Grandview Ave., Daytona Beach, Fla., 32018
Raymond H. Synnestvedt, Box 333, Bryn Athyn, Pa., 19009

CAMERON WEIFFENBACH,
May 14, 1985. *Director, Office of Enrollment and Discipline.*

Response to Drawing Requirements

The "Change in Drafting Practice" announcement, made in Mar. 1982 (1017 O.G.4), indicated that corrections to drawings or formal drawings had to be filed within a three-month period set in a Notice of Allowance (Rev. 2-85).

Henceforth, the period for response for filing corrections to drawings or formal drawings will be set in the Notice of Allowability, PTOL-37.

For your information, the period for response is a shortened statutory period of three (3) months, which may be extended under the provisions of 37 CFR 1.136 (a). The three (3) month shortened statutory period is calculated from the "Date Mailed" indicated on the Notice of Allowability (Rev. 2-85).

JAMES E. DENNY,
Apr. 30, 1985. *Deputy Assistant Commissioner for Patents.*

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

Joseph F. Nakamura,

Solicitor, U.S. Patent and Trademark Office,
v. Proceeding No. 84-2
Horace S. Harper, Jr.,

Respondent.

Notice by Publication

Notice is hereby given to the above named respondent, that proceedings under 35 U.S.C. §32 have been instituted against him. A copy of the *NOTICE OF PROCEEDINGS UNDER 35 U.S.C. §32,* including the charges against respondent, was twice mai led to the respondent's address of record. The notice was twice returned by the U.S. Postal Service.

Respondent may obtain of copy of the above-mentioned notice from:

Richard E. Schafer
Associate Solicitor
U.S. Patent and Trademark Office
P.O. Box 15667
Arlington, Va. 22215
(703) 557-4035

This notice will appear in the Official Gazette for four consecutive weeks beginning with the issue of June 11, 1985.

Respondent has thirty days from the date of the last notice to file an answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR §1.348 (c).

JOSEPH F. NAKAMURA,
Solicitor

By: RICHARD E. SCHAFER
Associate Solicitor.

Patents Available for Licensing or Sale

Des. 271,400. FOCUSSING CONTROL WITH ASTIGMATIC DIFFERING MEANS. *Chester Knighten,* Box 62, Foreman, Ark. 71836.

3,862,876. PROTECTIVE EDGE WEIGHTED COVER CLOTH. *L. Graves,* 5927 S. Grant, Littleton, Colo. 80121.

4,239,030. FIELD BURNER APPARATUS. *Everett H. Benson* — Correspondence to: Ruth L. Benson, 20568 S.E. Norse Rd., Eagle Creek, Oreg. 97022.

4,477,912. CORRELATION DATA COMMUNICATIONS SYSTEM. *James A. Oliff, Esq., Parkhurst & Oliff,* 277 S. Washington St., Suite 212, Alexandria, Va. 22314. Phone: 703-836-6400.

4,464,141. SHAFT COUPLING. *James A. Oliff, Esq., Parkhurst & Oliff,* 277 S. Washington St., Suite 212, Alexandria, Va. 22314, Phone: 703-836-6400.

4,323,118. APPARATUS FOR CONTROLLING AND PREVENTING OIL BLOWOUTS. *Conrad Bergmann,* 1365 Lincoln Ave., San Jose, Calif. 95125.

4,159,103. SLEEVE ACTUATED VALVE. *James A. Oliff, Esq., Parkhurst & Oliff,* 277 S. Washington St., Suite 212, Alexandria, Va. 22314. Phone: 703-836-6400.

4,499,644. APPARATUS FOR REPLACING A CHAIN. *George M. Goldsby,* Rte. 1, Ripley, Tenn. 38063.

4,403,807. BABYSEAT ATTACHMENT FOR SHOPPING CART. *Mrs. Dawn G. Wilkinson,* Rte. #1, Box 403, Fennville, Mich. 49408.

3,690,211. LONG SHOULDER PAD (for violin and viola). *Dorothy D. Long,* 13222 N. 22nd St., Phoenix, Ariz. 85022.

4,509,922. LEGAL EDUCATIONAL GAME AND METHOD OF TEACHING SUBJECT MATTER. *National Legal Information Services,* c/o Carl W. Battle, 301 Race St., Suite 315, Philadelphia, Pa. 19106. Phone: 215-592-3052.

4,476,961. PROCESS FOR PERFORMING THE CONSTRUCTION OF A PARKING GRIP CHOCK FOR A VEHICLE AND PARKING GRIP CHOCK FOR A VEHICLE MANUFACTURED FROM SHEET. *Luigi Picotti* — Correspondence to: Shlesinger, Arkwright, Garvey & Fado, 2001 Jefferson Davis Hwy., Suite 607, Arlington, Va. 22202. (703-521-1500).

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: General Electric Co., Motor Business Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801-2204, Attention: Patent Counsel.

4,349,807. HEATING AND COOLING THERMOSTAT WITH ADJUSTABLE LIMITS AND METHODS OF MANUFACTURING AND OPERATING THE THERMOSTAT.

4,355,458. METHOD OF MAKING AN ELECTRICAL CONTROL.

4,484,116. PRIME MOVER AND METHOD OF OPERATING AN ELECTRICAL SWITCH.

4,500,824. METHOD OF COMMUTATION AND CONVERTER CIRCUIT FOR SWITCHED RELUCTANCE MOTORS.

3,998,643. This patent has been withdrawn from the list of Patents Available for License or Sale by General Electric.

American Hospital Supply Corp. is prepared to grant non-exclusive licenses under the following patents to parties newly entering into the manufacture and/or assembly and sale of disposable blood pressure monitoring equipment.

Applications for licenses and license terms should be addressed to: Lyman E. Lance, President, American Pharmaseal Medical/Surgical Division, American Hospital Supply Corp., 1015 Grandview Ave., Glendale, Calif. 91209.

4,267,833. METHOD OF FLUSHING A MEDICAL FLUID.

4,267,834. SYSTEM FOR FLUSHING A MEDICAL FLUID.

4,267,835. MEDICAL FLUSHING VALVE.

PATENT NOTICES

Certificates of Correction for the Week of June 11, 1985

Re. 31,637	4,446,358	4,479,220	4,491,037
Re. 31,709	4,450,306	4,479,352	4,491,557
Re. 31,828	4,451,421	4,480,003	4,491,617
D. 271,149	4,451,453	4,480,901	4,492,781
D. 274,608	4,452,842	4,481,532	4,493,312
3,975,536	4,453,952	4,481,888	4,494,878
4,232,943	4,454,120	4,482,227	4,494,964
4,249,270	4,456,461	4,482,849	4,495,373
4,263,368	4,460,670	4,484,030	4,495,711
4,268,399	4,464,451	4,484,321	4,495,835
4,286,318	4,465,359	4,484,586	4,495,888
4,302,284	4,467,366	4,484,674	4,496,702
4,310,651	4,469,251	4,485,366	4,496,891
4,310,815	4,473,221	4,485,699	4,497,151
4,327,804	4,474,783	4,485,727	4,497,230
4,372,256	4,474,946	4,485,766	4,497,346
4,374,514	4,475,048	4,485,874	4,497,457
4,381,147	4,475,443	4,485,939	4,497,729
4,387,680	4,475,713	4,486,294	4,498,277
4,394,938	4,476,002	4,486,323	4,498,686
4,395,285	4,476,280	4,486,542	4,498,753
4,404,474	4,476,295	4,486,552	4,498,864
4,409,069	4,476,415	4,486,567	4,498,904
4,417,007	4,476,903	4,486,586	4,499,240
4,425,111	4,477,126	4,486,786	4,500,078
4,426,260	4,477,555	4,486,857	4,500,379
4,429,000	4,477,600	4,487,121	4,500,402
4,434,140	4,477,982	4,487,762	4,501,025
4,439,426	4,478,537	4,489,309	4,501,536
4,442,631	4,478,626	4,489,930	
4,442,842	4,478,676	4,490,517	
4,443,432	4,478,900	4,490,978	

Disclaimers

4,075,493.—*Kenneth A. Wickersheim,* Palo Alto, Calif. OPTICAL TEMPERATURE MEASUREMENT TECHNIQUE UTILIZING PHOSPHORS. Patent dated Feb. 21, 1978. Disclaimer filed Apr. 22, 1985, by the assignee, *Luxtron Corp.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 8, 9 and 22 of said patent.

4,388,495.—*Myron H. Hitchcock,* Englewood, Colo. SPEECH RECOGNITION MICROCOMPUTER. Patent dated June 14, 1983. Disclaimer filed Apr. 15, 1985, by the assignee, *Figgie International, Inc.*

Hereby enters this disclaimer to claim 14 of said patent.

4,450,877.—*Stephen E. Walker,* Buckingham; *Keith Bedford,* Newport Pagnell; and *Terence Eaves,* Woburn Sands, England. PHARMACEUTICAL PREPARATIONS IN SOLID UNIT DOSAGE FORM. Patent dated May 29, 1984. Disclaimer filed Mar. 29, 1985, by the assignee, *Hoechst Aktiengesellschaft.*

Hereby enters this disclaimer to claims 2 and 10 of said patent.

4,457,206.—*Peter P. Toulios,* Oakbrook and *Kenneth D. Hartman,* Dekalb, Ill. MICROWAVE-TYPE PROJECTILE COMMUNICATION APPARATUS FOR GUNS. Patent dated July 3, 1984. Disclaimer filed Mar. 25, 1985, by the assignee, *Ares, Inc.*

Hereby enters this disclaimer to claims 1–30 of said patent.

4,492,704.—*Jerome H. Fleisch,* Indianapolis; *Winston S. Marshall,* Bargersville and *George J. Cullinan,* Trafalgar, Ind. QUINOLINE QUINONES AND ANTI-ASTHMATIC USE THEREOF. Patent dated Jan. 8, 1985. Disclaimer filed Apr. 15, 1985, by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to claims 1–4 and 15–19 of said patent.

4,500,676.—*Endre A. Balazs,* Riverdale and *Adolf Leshchiner,* Brooklyn, N.Y. HYALURONATE MODIFIED POLYMERIC ARTICLES. Patent dated Feb. 19, 1985. Disclaimer filed Mar. 15, 1985, by the assignee, *Biomatrix, Inc.*

The term of this patent subsequent to Dec. 11, 2001 has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
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	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4243
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 11, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	3-08-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-05-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	5-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-23-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-03-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-26-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-17-83

Expiration of patents: The patents within the range of numbers indicated below expire during May 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,381,303 to 3,386,102, inclusive

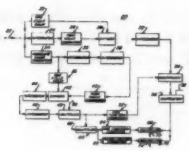
Plant Patents ..... Numbers 2,811 to 2,813 inclusive

REEXAMINATIONS

JUNE 11, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,602,706 (357th)
DATA-PROCESSING METHOD AND MEANS FOR CLASSIFYING SIGNALS IN A FIRST OR SECOND STATE
Joseph R. Levitt, Moorestown, N.J., assignor to Data Display Systems, Inc., New York, N.Y.
Reexamination Request No. 90/000,481, Dec. 14, 1983.
Reexamination Certificate for Patent No. 3,602,706, issued Aug. 31, 1971, Ser. No. 787,335, Dec. 27, 1968.
Int. Cl.[3] G06G *7/22*; A61B*5/04*
U.S. Cl. 364—551



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–12** are cancelled.

[1. Machine implemented process for determining the physical state of a system characterized by a time-varying signal which comprises the following steps, each of which is executed by automatic computing apparatus

a. obtaining a time-varying signal characterizing a system in either a first or second physical state,

b. transforming the time-varying signal obtained in step into a coordinate system having at least one curvilinear coordinate, (a) by a nonlinear coordinate transformation which transformation transforms said signal into defined first or second classes corresponding to the first and second physical states of step (a)

c. and determining whether said transformed signal of step (b) is the first or second class defined by step (b) for establishing whether the system of step (a) is in said first or second state.]

B1 4,287,404 (358th)
ELECTRODE FOR ELECTRICAL DISCHARGE MACHINING
Danielle Convers, Geneva; Francois Balleys, Vernier, and Jean Pfau, Geneva, all of Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland
Reexamination Request No. 90/000,485, Jan. 6, 1984.
Reexamination Certificate for Patent No. 4,287,404, issued Sep. 1, 1984, Ser. No. 14,927, Feb. 26, 1979.
Claims priority, application Switzerland, Mar. 3, 1978, 2317/78; May 5, 1978, 4872/78
Int. Cl.[3] B23P *1/12*
U.S. Cl. 219—69 W

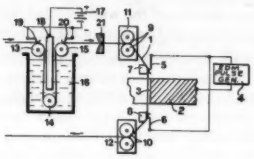
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **7** is cancelled.

Claims **1–3, 6, 8–11, 13** and **14** are determined to be patentable as amended.

Claims **4, 5,** and **12,** dependent on an amended claim, are determined to be patentable.

1. In combination with an EDM apparatus, a *wire* [filament] electrode for electrical discharge [machining] *cutting* of a workpiece wherein said *wire* [filament] electrode is *continuously moving* [displaced] longitudinally *in a single direction* and *is displaced* laterally through the workpiece *during cutting of the workpiece,* said *wire* [filament] electrode



comprising a core made of material having a relativey high mechanical strength and a relatively thin metallic surface coating on said core, said metallic surface coating comprising at least 50% of a metal having a low temperature of vaporization selected from the group consisting of zinc, cadmium, [tin,] lead, antimony, bismuth and an alloy thereof, *wherein said wire electrode is continuously supplied to a machining zone formed between a lateral surface of said wire electrode and said workpiece during cutting of said workpiece.*

B1 4,285,380 (359th)
PANEL FASTENER
Bulent Gulistan, Woodland Hills, Calif., assignor to VSI Corporation, Pasadena, Calif.
Reexamination Request No. 90/000,196, May 6, 1982.
Reexamination Certificate for Patent No. 4,285,380, issued Aug. 25, 1981, Ser. No. 25,363, Mar. 30. 1979.
Int. Cl.[3] F16B *43/00*
U.S. Cl. 411—103

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. In a panel fastener of the type having a stud assembly that has a stud and which is adapted to be attached to a substructure, a stud nut adapted to be attached to a panel and to engage the stud, and a retaining ring adapted to hold the stud nut to a top panel while permitting the stud nut to move along its axis for approaching toward and retracting away from the stud

assembly, the retaining ring being in compressive radial bearing with the stud nut over a continuous range of axial positions of the stud nut with respect to the panel, an improvement which comprises:

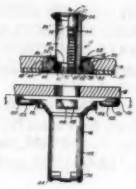
(a) a clear through bore in the stud nut;

(b) an internally threaded section at one end of the bore;

(c) a hardened wrenching insert at the other end of the bore having a wrenching socket adapted to receive a wrenching tool;

(d) a thin plug in the bore between the wrenching insert and the internal threads to separate the two;

(e) a grommet adapted for attachment to the top panel, and having a wall defining an axial bore for receiving the stud nut, a standoff base adapted for receipt in a counterbore in the top panel and for extending below the lower surface of the top panel to present a barrier to a gasket from moving radially inward towards the axis of the stud nut, an annular interior groove in the standoff portion opening into the axial bore and spaced from a lower surface of the standoff portion by a portion of the wall defining the axial bore, the groove receiving and capturing the retaining ring, a neck integral with and axially adjacent the standoff base, and having a major outer diameter less than the major outer diameter of the standoff base, and a seating and clamping section integral with and axially adjacent the neck, the seating and clamping section being adapted to be flared



radially outward from the axis of the axial bore to define a conical seat for a head of the stud nut and to cooperate with the standoff base in clamping the grommet to the top panel.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,909

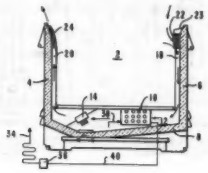
REFRIGERATED DISPLAY CASE HAVING AMBIENT AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Original No. 4,295,340, dated Oct. 20, 1981, Ser. No. 60,459, Jul. 25, 1979. Continuation-in-part of Ser. No. 11,804, Feb. 14, 1979,. Application for reissue Oct. 19, 1983, Ser. No. 543,468

Int. Cl.³ A47F *3/04*; F25D *21/12*

U.S. Cl. 62—82 **32 Claims**



1. An open top refrigerated display case being selectively operative in a refrigeration cycle and a defrost cycle, said case comprising: a bottom wall and four side walls; a single air conduit extending along a first of said side walls, along said bottom wall and a second of said side walls, said first and second side walls being opposing side walls, said air conduit having first and second openings at its opposite ends and each of said openings being located near the top portion of the respective said side wall; means for refrigerating air moving through said conduit during a refrigeration cycle, said means for refrigerating being arranged within said air conduit, air circulating means arranged within said air conduit, said air circulating means circulating within said air conduit in a forward direction during a refrigeration cycle and circulating air in a reverse direction during a defrost cycle, and said air circulating means drawing in ambient air from outside of said display case through said first opening when said air circulating means circulates air within said air conduit in the reverse direction; means for switching operation of said display case between a refrigeration cycle and a defrost cycle and correspondingly causing said air circulating means to change the direction of circulation of air within said air conduit; and means for directing air leaving said air conduit upwardly and over the outside of the adjacent said side wall so as to flow away from said case when such air is flowing in said reverse direction so that such air is prevented from reentering said air conduit.

Re. 31,910

REMOVABLE CORE CYLINDER LOCK

Roy N. Oliver, Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Original No. 4,328,690, dated May 11, 1982, Ser. No. 175,220, Aug. 4, 1980. Application for reissue May 3, 1984, Ser. No. 606,689

Int. Cl.³ E05B *27/04*

U.S. Cl. 70—369 **7 Claims**

1. A removable core cylinder lock comprising:

(a) a cylinder lock shell have a cavity therethrough for reception of a cylinder lock case;

(b) means defining a retaining recess in the wall of the cavity intermediate the ends of the shell;

(c) an interchangeable cylinder lock case with an outside configuration to slidably fit into the cavity into the shell, the case including a plurality of pin tumbler holes and an interrupted cylindrical shape passage extending lengthwise of the case;

(d) a cylinder locking retainer having parallel pin tumbler holes and a cylindrical shaped passage shaped to correspond with the interrupted cylindrical shaped passages in the lock case to form a completed cylindrical passage through the lock case and retainer, the retainer being rotatable in the shell to a limited extent;

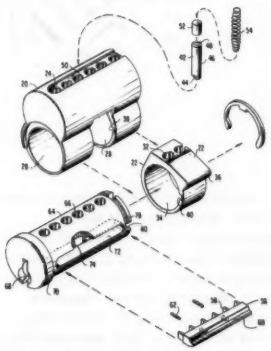
(e) a projection on the outer surface of the cylinder retainer for cooperating with the retainer recess when the retainer is rotated in one direction and clearing the retainer recess when the retainer is rotated in an opposite direction;

(f) means defining a latch bar groove in the wall of the completed cylindrically shaped passage in the lock case and retainer;

(g) twisting pin tumblers each having a pointed inner end and a longitudinal groove, one pin tumbler positioned in each pin tumbler hole in the lock case and retainer;

(h) a driver pin in each of the pin tumbler holes above the pin tumbler and means for biasing the driver pins and pin tumblers toward the longitudinal center of the case;

(i) a latch bar having projections from one side thereof cooperating with the longitudinal grooves in the pin tumblers when the tumblers are correctly oriented by a twisting movement, the opposite side of the latch bar from the projection being shaped to cooperate with the latch bar groove such that when any one projection is not in a tumbler groove, the latch bar will be kept seated in the latch bar groove



(j) a cylinder having a key way, pin tumbler holes, a slot for lateral movement of the latch bar, and an outside cylindrical surface for rotary movement inside the completed cylindrical passageway in the case and the retainer;

(k) an operating key having at least some bits cut at skew angles to cause the tumblers to raise to a shear line defined by the outside surface of the cylinder and the completed cylindrical passage and to twist to present the longitudinal groove to the latch bar projections at each tumbler position thereby allow the operating key to rotate the cylinder and operate the locks;

(l) a control key having its bits cut at the same angles as the operating key, the bits causing the tumblers to raise to a core removal shear line defined by the surface of the retainer and a cooperating surface of the case for at least one tumbler and defined for the remaining tumblers by the outside surface of the cylinder and the completed cylinder passage, and to cause the tumblers to twist to present the

longitudinal groove of each tumbler to the latch bar projections to allow the key to retract the retainer projection from the recess and allow the core to be removed.

Re. 31,911

COUPLED SHELLS FOR VACUUM POWER SERVO BOOSTER

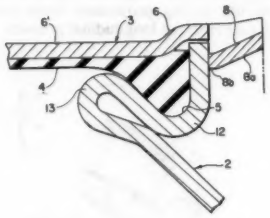
Ryuji Ohta, and Michio Kobayashi, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Japan

Original No. 4,296,680, dated Oct. 27, 1981, Ser. No. 85,830, Oct. 17, 1979. Application for reissue Oct. 27, 1983, Ser. No. 545,980

Claims priority, application Japan, Dec. 1, 1978, 53/148803; Dec. 1, 1978, 53/148804

Int. Cl.³ F01B *19/00;* F16J *3/02*

U.S. Cl. 92—98 D **7 Claims**



7. A vacuum power servo booster comprising:

a generally disc-shaped first shell,

a generally cup-shaped second shell, said first and second shells defining an outer casing of said booster, and

a diaphragm secured between said first and second shells which divides the casing into two chambers,

an annular groove being integrally formed at a peripheral end portion of said first shell, said annular groove opening radially outwardly and said annular groove being defined by a first annular bent portion bulging radially inwardly from the peripheral end portion of said first shell and a second annular bent portion at an inward position of said first shell, said second annular bent portion being oriented approximately along the axial direction of said booster and bulging toward said second shell, said second shell having a cylindrical portion adapted for insertion of said first shell therein, peripheral end portions of said diaphragm being interposed between said annular groove and said cylindrical portion, and

said second shell being provided with at least one axial recess in said cylindrical portion, said first shell being provided with at least one radially outward protrusion adapted to be received in said recess, said first shell being further provided with a plurality of arcuate radial recesses at the outer peripheral surface thereof, and a plurality of locking portions arranged in an alternating manner between said recesses, said second shell being provided with locking means for engaging said locking portions, said locking means comprising radially inwardly extending arcuate locking pawls, said pawls being inclined toward the axis of said second shell so as to define guide surfaces, whereby peripheral portions of said diaphragm may smoothly pass over said guide surfaces in sliding contact therewith, without damage to said diaphragm.

Re. 31,912

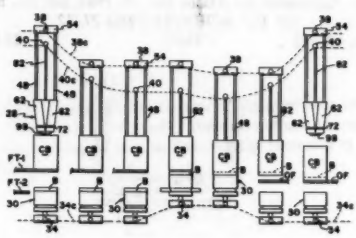
INERTIAL SPIN WELDING OF THERMOPLASTIC AND THERMOPLASTIC COATED CONTAINER PARTS

Vincent E. Fortuna, Huntington Beach, Calif., and Donald N. MacLaughlin, Midland, Mich., assignors to Cosden Technology, Inc., Dallas, Tex.

Original No. 4,386,999, dated Jun. 7, 1983, Ser. No. 415,126, Sep. 7, 1982. Continuation-in-part of Ser. No. 234,344, Feb. 13, 1981, abandoned. Application for reissue Jul. 20, 1983, Ser. No. 515,418

Int. Cl.³ B23K *27/00;* B29C *27/08;* B29D *23/03;* B28C *1/08*

U.S. Cl. 156—494 **12 Claims**



1. Spin welding apparatus comprising upper and lower mandrel means mounted for vertical movement toward and away from each other along a common vertical axis, said upper mandrel means being adapted to releasably support an open ended cylindrical container body and said lower mandrel means being adapted to releasably support a container bottom of thermoplastic material having an axially upwardly projecting peripheral flange insertable into said container body with a press fit, first drive means for driving at least one of said mandrel means in rotation about said vertical axis relative to the other mandrel means, and second drive means for driving said mandrel means in movement along said vertical axis to seat said container bottom within said container body while said mandrel means are rotating relative to each other to insert and frictionally weld said container bottom in said container body; with radially expansible and contractable body engaging means mounted on the lower end of said upper mandrel means in symmetrically disposed relationship about said vertical axis, said engaging means being normally disposed in a contracted position wherein said engaging means may be axially inserted into a container body, expanding means for radially expanding said engaging means to an expanded position wherein the radially outer surfaces of said expanding means lie on a common cylindrical surface having a diameter equal to the specified internal diameter of said container body and further comprising a seating member mounted at the lower end of said upper mandrel means and engagable with said container bottom to establish the depth to which said container bottom is inserted within said container body by operation of said second drive means.

Re. 31,913

APPARATUS FOR THE CONTINUOUS EXTRACTION OF OILS AND SOLUBLE SUBSTANCES FROM SOLID MATERIALS

William M. Barger, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Original No. 4,313,912, dated Feb. 2, 1982, Ser. No. 195,577, Oct. 8, 1980. Application for reissue Jan. 30, 1984, Ser. No. 574,802

Int. Cl.³ B01D *11/02*

U.S. Cl. 422—267 **8 Claims**

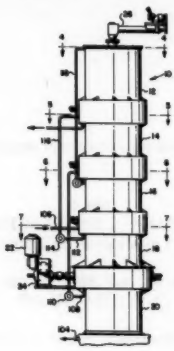
1. In a continuous solvent extracting apparatus, having a cylindrical housing, material distribution means in an upper portion of said housing, a plurality of vertically stacked extractor sections each including a plurality of vertically disposed

radially extending walls for receiving material therebetween from said material distribution means, screening means beneath said walls for retaining processed material in a section and passing miscella therethrough, a collecting pan associated with and beneath each screening means for collecting miscella passed therethrough, miscella distribution means for removing miscella from said pans and supplying miscella to an upper portion of each section and material removal means for removing material from a lowermost extractor section, wherein the improvement comprises:

said plurality of walls are stationary and abut said housing with each adjacent pair of walls and said housing forming a basket with said baskets in each section being in registry with said baskets in all other sections;

each said screening means being horizontally disposed, disc-shaped, mounted for rotation and having an opening defined therein generally co-extensive with a basket when in registry therewith;

each said pan having an opening defined therein in alignment with said opening defined in said associated screening mean for passing material from a basket of one section to a basket of a subsequent section and mounted for rotation with said associated screening means; and



means for rotating each said associated screening means and said pan simultaneously.

PLANT PATENTS

GRANTED JUNE 11, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,488
CUPRESSUS MACROCARPA

Donald J. Liddle, 42 Ngarara Rd., Waikanae, Wellington, New Zealand

Filed Apr. 6, 1983, Ser. No. 482,620
Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—50 **1 Claim**

1. A new and distinct variety of Cypress *Cupressus macrocarpa* named "Golden Halo" substantially as shown and described which is a sport of the *Cupressus macrocarpa* "Gold Spread" characterized particularly by low spreading habit and unique arching of branches from the base, stiff outward facing branching system, and by bright yellow coloring of the foliage, being most pronounced in the new stem growth in summer.

5,489
AFRICAN VIOLET PLANT NAMED CLEVELAND

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,396
Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. An African violet plant named Cleveland, as described and illustrated, and particularly characterized by its intensive purple-red flower color which is resistant to fading under high temperatures, its girl type leaves, which are medium to dark green and shiny, with bright green leaf centers, strong and upright flower stems, and by its vigorous yet compact growth habit.

5,490
CHRYSANTHEMUM PLANT — NAMED ILLINI MIST

John R. Culbert, Clinton, Ill., assignor to University of Illinois, Chicago, Ill.

Filed Apr. 25, 1983, Ser. No. 488,072
Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct form of chrysanthemum plant named Illini Mist, as described and illustrated, and particularly characterized by its flat capitulum form and single capitulum type; pink tubular shaped spoon tipped ray florets; 60–70 mm. diameter across face of capitulum; excellent flower production, and its short and compact growth habit.

5,491
CHRYSANTHEMUM PLANT NAMED FROSTY

Leonard H. Shoesmith, Surrey, United Kingdom, and Peter S. Hesse, Bradenton, Fla., assignors to Pan American Plant Company, Parrish, Fla.

Filed Apr. 26, 1983, Ser. No. 488,771
Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant named Frosty, as described and illustrated, and particularly characterized by its flat capitulum form, single anemone flower type, white ray floret color, immature lime green to mature pale yellow disc florets, 35–45 mm. diameter across capitulum face, semi-upright branching habit, and its relatively short plant height.

5,492
POINSETTIA NAMED ANGELIKA

Gregor Gutbier, Linz am Rhein, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Jul. 1, 1983, Ser. No. 510,422
Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct poinsettia cultivar, substantially as herein shown and described, particularly distinguished by its habit of blooming earlier and at a lower temperature than Poinsettia V-14 (U.S. Plant Pat. No. 4,384) which it most nearly resembles.

PATENTS

GRANTED JUN. 11, 1985

ERRATA

For CLASS	See PATENT NO.
225–002	4,522,323
361–407	4,522,449
358–075	4,522,506
416–187	4,522,558
043–016	4,522,572
514–002	4,522,811
514–007	4,522,812
514–011	4,522,813
514–054	4,522,814
514–034	4,522,815
514–052	4,522,816
514–095	4,522,817
514–155	4,522,818
514–187	4,522,819
514–288	4,522,820
514–320	4,522,821
514–376	4,522,822
514–400	4,522,823
514–414	4,522,824
514–517	4,522,825
514–569	4,522,826
514–671	4,522,827
514–646	4,522,828
514–652	4,522,829
514–690	4,522,830
514–169	4,522,831
514–200	4,523,206

PATENTS

GRANTED JUNE 11, 1985

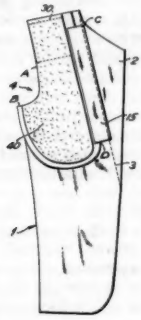
GENERAL AND MECHANICAL

4,521,921

EXPANDABLE CHEST PIECE AND METHOD OF CONSTRUCTING A GARMENT USING SAME

Ray J. Bregatta, Cherry Hill, N.J., assignor to Pellon Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,748
Int. Cl.³ A41D *1/02, 27/02*
U.S. Cl. 2—93 **12 Claims**



1. An expandable chest piece for a garment comprising:

a carrier member composed of relatively stiff textile material and configured to have a first connecting edge in the vicinity of the lapel break line and a second connecting edge in the vicinity of the arm hole of a garment;

an elongated connecting strip composed of relatively stiff textile material and configured to extend substantially the entire length of the first connecting edge; and

means, composed of relatively flexible textile material, connecting the strip to the carrier member for movement from a rest position wherein the connecting strip overlaps the first edge with the outer edge of the strip spaced therefrom and substantially parallel thereto to an extended position wherein the outer edge is spaced further from the first edge.

7. In a method of constructing a garment wherein a chest piece is connected to the garment fabric between the arm hole and the lapel break line, the improvement comprising the steps of:

a. prefabricating the chest piece by providing a carrier member composed of relatively stiff textile material and configured to have a first connecting edge in the vicinity of the lapel break line and a second connecting edge in the vicinity of the arm hole of the garment and connecting an elongated connecting strip composed of relatively stiff textile material and configured to extend substantially the entire length of the first connecting edge to the carrier member for movement from a rest position wherein the connecting strip overlaps the first edge with the outer edge of the strip spaced therefrom and substantially parallel thereto to an extended position wherein the outer edge is spaced further from the first edge;

b. positioning the chest piece on the fabric with the second edge aligned with the arm hole;

c. aligning the outer edge of the connecting strip with the lapel break line and connecting same to the fabric, without changing the position of the carrier member, by moving the connecting strip from the rest position, if necessary; and

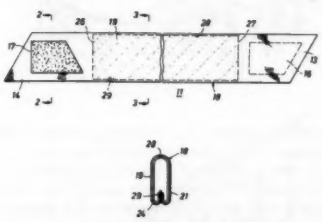
d. connecting the second edge to the fabric.

4,521,922

EVAPORATIVE NON-DRIPPING SWEAT BAND

Albert W. Mitchell, Houston, and Richard W. Miller, Sugar Land, both of Tex., assignors to Wet Wraps, Inc., Houston, Tex.

Filed Feb. 3, 1983, Ser. No. 463,396
Int. Cl.³ A42B *1/00*
U.S. Cl. 2—171 **10 Claims**



1. A head-encircling non-dripping sweat band comprising:

(a) an elongated tubular body adapted to be placed between the hairline and eyebrows of the user and secured by a pair of loose ends rearwardly of the users head;

(b) gripping means for releaseably securing said loose ends together;

(c) said body formed by a porous cloth cover folded lengthwise and being cut across its grain to provide bias panels to each side of the lengthwise fold;

(d) a layer of porous thick resilient batting material extending over a portion of the width of the panels and being enclosed within said porous cloth cover, said layer is secured by lengthwise stitching adjacent the fold in said cloth cover and by lengthwise stitching along its edges and to edges along said panels, and

(e) said batting material in said body extending in length across the user's brow and to his temples so that perspiration from the brow is wicked by said batting material for evaporation through said porous cloth, and any excess perspiration will travel to the ends of said batting material for release into the users sideburns; said body during use being pulled into a substantially flat belt-like band across the users brow but resuming its original tubular configuration upon release of tensioning force.

4,521,923

NAME BELT WITH SELECTIVE LETTER INSERTS

Charles P. Mackey, P.O. Box 847, Chickasha, Okla. 73018

Filed Dec. 13, 1983, Ser. No. 561,041
Int. Cl.³ A41F *9/00*
U.S. Cl. 2—338 **17 Claims**

1. A decorative name belt comprising:

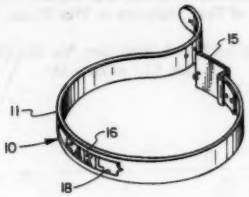
an elongated flexible belt member having opposed inner and outer surfaces and including fastening means for securing the belt around a person's waist, said belt member including means forming a recess in said outer surface of said belt member;

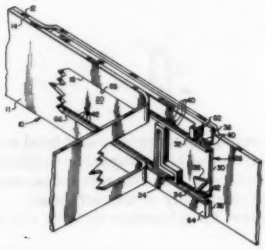
support means on said belt member for supporting a plurality of indicia members in said recess at selective spaced intervals to provide decorative indicia on said belt;

at least one indicia member including means cooperable with said support means for securing said one indicia member in said recess in a selected position;

said one indicia member comprises a separate member selectable at will for securement to said support means by cooperating surfaces on said one indicia member and said support means, respectively; and,

said support means includes an elongated support member having a web portion disposed between opposed flange means, said flange means each including means defining a pluarality of spaced apart slots formed therein, and said one indicia member includes at least one boss projecting





from one side of said indicia member and a key extending from an opposite side of said indicia member, said boss and said key being insertable in selected ones of said slots on respective ones of said flange means for retaining said indicia member on said support member.

4,521,924

ELECTRICALLY DRIVEN ARTIFICIAL ARM

Stephen C. Jacobsen; David F. Knutti, and R. Todd Johnson, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Mar. 1, 1983, Ser. No. 470,927
Int. Cl.³ A61F *1/00, 1/06*
U.S. Cl. 3—1.1 **28 Claims**

20. In a prosthesis for a person with an amputation above the elbow, said prosthesis including an upper arm socket which is adapted to be attched to the stump or shoulder portion of the person's torso and an elbow and forearm section attached to said upper arm socket, an improved connection means between the upper arm socket and the elbow section which provides humeral rotation, said improved connection means comprising:

an annular fitting which is adapted to be attached to the end of the upper arm socket, said annular fitting having a cylindrical end portion which extends away from the upper arm socket and which as a substantially flat, circular end face, said cylindrical end portion being substantially coaxial with the longitudinal axis of the upper arm socket, said cylindrical end portion further having a circumferencial flange or ring adjacent to the flat, circular end face thereof;

providing the elbow section with a substantially flat upper end;

an annular friction band having an annular recess formed around the inside surface at one end portion thereof so that the annular recess is adapted to engage the circumferential flange on said annular fitting, with the other end portion of the friction band adapted for attachment to the upper end of the elbow section to hold the flat upper end of the elbow section in parallel closely spaced relationship with the flat, circular end of the annular fitting; and

an adjustable tension band adapted to encircle the friction band and to provide adjustable compression of the friction band,

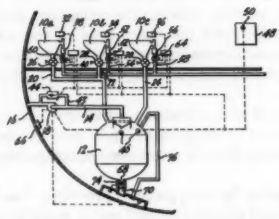
whereby the ease with which the elbow section can be rotated relative to the upper arm socket can be adjusted incrementally between essentially free rotation and various degrees of restrained rotation by adjusting the tension band to increase or decrease the compression exerted by the tension band on the friction band.

4,521,925

NONRECIRCULATING VACUUM FLUSH TOILET SYSTEM UTILIZING FRESH WATER

Tyen C. Chen, Bellevue; Forrest B. Busching, Tacoma; William D. Hale, Everett, and Bjorn R. Kristoffersen, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 30, 1982, Ser. No. 393,828
Int. Cl.³ E03D *3/10*
U.S. Cl. 4—362 **14 Claims**



1. A vacuum flush toilet system utilizing fresh water to assist in flushing for use in aircraft, said toilet system comprising:

a toilet bowl for receiving waste;

a waste-holding tank;

drain means coupled in fluid communication between said toilet bowl and said waste-holding tank for conveying waste from said toilet bowl to said waste-holding tank;

flush valve means associated with said drain means selectively operable to permit the passage of waste through said drain means;

evacuation means coupled to said waste-holding tank for creating at least a partial vacuum in said waste-holding tank;

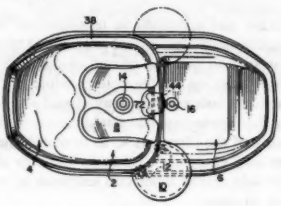
water introduction means connected to said toilet bowl and to a source of fresh water for supplying fresh water to said toilet bowl; and

a water inlet valve means connected to said water introduction means and selectively operable to stop the flow of fresh water to said toilet bowl.

4,521,926
BATH CHAIR

Christian L. Kuether, 5302 Crawford St., Houston, Tex. 77004

Filed Sep. 24, 1982, Ser. No. 425,042
Int. Cl.[3] A47K *3/022*
U.S. Cl. 4—579 11 Claims

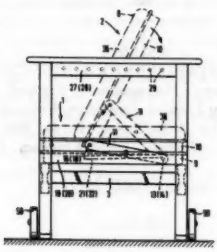


1. Apparatus for bathing comprising:
a chair having a seat portion and a back portion;
means for securing said chair to a bathtub comprising stabilizing means attached to said chair for gripping interior walls of said bathtub,
whereby said chair may be placed in a bathtub and secured thereto and,
wherein said stabilizing means comprises a flexible ring secured to said chair and further comprises means to compress said ring along one direction to expand said ring in a dimension transverse to said direction to secure said stabilizing means to said bathtub.

4,521,927
DAVENPORT CONVERTIBLE TO A DOUBLE BED OR A SINGLE BED

Oswald Brunn, Bunzlauer Platz 1, 8000 Munich 50, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,247
Int. Cl.[3] A47C *17/32, 17/16*
U.S. Cl. 5—37 R 13 Claims

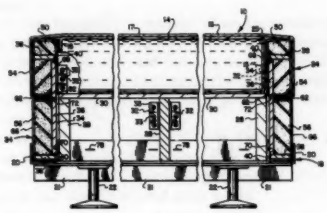


1. A davenport comprising: two beds disposed on a supporting frame having a front edge, each bed having a front edge, a rear edge, and two opposite end frame members, one bed being foldable upwardly with respect to the other bed to form a sofa back such that the front edge of the sofa back is located above the rear edge of the other bed, one bed being adapted to be placed over the other bed face up and congruently therewith, two coupling bars joining the respective end frame members of said beds, two pivot pins arranged at a certain distance from the rear edge of said other bed and pivotally connecting the respective coupling bar to the respective end frame member of said other bed, and two pairs of pins for connecting the respective coupling bar to the respective end frame member of the one bed, one pair of said pairs of pins being releasable from engagement with the coupling bars.

4,521,928
WATERBED FRAME CONSTRUCTION

Michael C. Stephenson, 2520 44th St., Lubbock, Tex. 79413

Filed Jun. 15, 1983, Ser. No. 504,384
Int. Cl.[3] A47C *19/00, 27/08*
U.S. Cl. 5—400 14 Claims

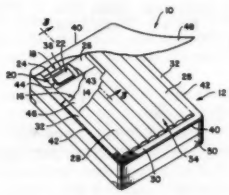


1. A frame for supporting a waterbed mattress comprising:
a substantially rectangular perimeter frame portion comprising opposed parallel side frame members and opposed parallel end frame members forming an enclosure for containing a flexible waterfilled bladder comprising said mattress to prevent lateral bulging of said mattress, and means forming a support deck for supporting said mattress, said side and end members being formed by elongated shallow channel section members having a vertically extending web and opposed generally horizontally extending flanges, the lower one of said flanges being adapted for supporting said frame on a bed sub-frame and the upper one said flanges forming a perimeter edge of said frame adjacent the sleeping surfaces of said mattress, and resilient cushion pad means extending along the outer sides of the webs of at least said side members and one of said end members, said pad means being formed to include a substantially horizontally extending slot along said side members and said at least one end member for receiving the peripheral edge of an article of bedclothing to retain said article covering said mattress.

4,521,929
HEATED WATERBED

Donald W. Keefer, Pasadena, Md., assignor to Classic Corp., Jessup, Md.

Filed Feb. 6, 1984, Ser. No. 577,360
Int. Cl.[3] A47C *27/08*
U.S. Cl. 5—422 14 Claims

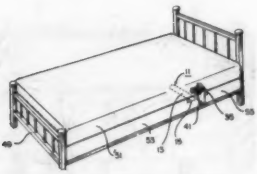


1. A heated waterbed comprising:
(a) an outer frame and a frame base together defining a central cavity;
(b) a sunken frame positioned underneath a portion of the central cavity, the sunken frame defining a cavity well;
(c) a heating unit positioned at the bottom of the cavity well;
(d) a water-filled container overlying the heating unit in the cavity well; and
(e) a plurality of water-filled receptacles together forming a waterbed mattress positioned in the central cavity, a portion of each water-filled receptacle being in contact with the water-filled container in the cavity well.

4,521,930
PISTOL MOUNTING BRACKET

Jack C. Henson, 881 Elwood, Abilene, Tex. 79065

Filed Nov. 8, 1982, Ser. No. 439,827
Int. Cl.[3] A47B 96/06
U.S. Cl. 5—508 1 Claim



1. A pistol mounting bracket for mounting a pistol holster onto a bed, the pistol holster being of the type having a pistol receiving pouch and a belt loop attached to the pouch for securing the holster to the body of the wearer, comprising:

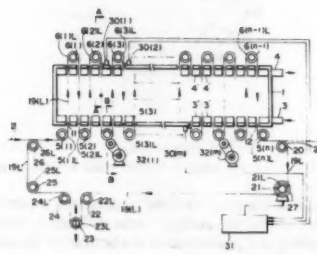
a generally planar support arm having a longitudinal extent adapted to be fitted under a bed mattress, the length of said support arm being selected so that the weight of said bed mattress is sufficient to retain said support arm on said bed; and

a holding arm, generally rectangular in shape, having a fixed end connected to said support arm and depending therefrom in a plane generally perpendicular to the plane of the support arm and having an opposite flange end adapted to be slidingly received within the belt loop of said holster pouch with means for supporting a pistol holster, said means including a protruding portion at an outer extent of said flange end which provides greater relative width to said holding arm at said flange end than at said fixed end to thereby resist sliding movement of said holster loop along an axis parallel to the longitudinal axis of said holding arm.

4,521,931
METHOD FOR THREADING FILAMENTS ON ROLLERS OF OXIDIZING FURNACE AND APPARATUS THEREFOR

Kosuke Katsuki; Youiti Nishioka, both of Ehime, and Susumu Nomura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,352
Claims priority, application Japan, Dec. 7, 1982, 57-214241
Int. Cl.[3] D06B 3/04
U.S. Cl. 8—149.2 17 Claims



1. A method for threading acrylic filaments on one roller after another of an oxidizing furnace by moving said filaments from the entrance to the exit of said oxidizing furnace, said method comprising:

(a) maintaining an atmospheric temperature in said oxidizing furnace at 180° C. to an oxidizing temperature;

(b) fastening the tips of said filaments to be threaded to a filament-fastening bar spanning a pair of right and left chains which engage chain wheels attached at the both ends of each roller freely rotatable against said roller and turn in a zigzag manner around one chain wheel after another from said entrance to said exit of said oxidizing furnace;

(c) moving, under said atmospheric temperature, said paired chains and said filament-fastening bar attached to said chains from said entrance to said exit of said oxidizing furnace and threading said filaments on the rollers while said filament-fastening bar turns successively around said rollers; and

(d) controlling the moving speed of said chains with progress of heat-treating of the filaments so as to match the behavior of shrinkage and elongation of said filaments during the movement of said chains from said entrance to said exit of said oxidizing furnace.

5. An apparatus for threading acrylic filaments on rollers of an oxidizing furnace wherein there are a series of first rollers and a series of second rollers with a spacing to said first rollers, and on said first rollers and said second rollers are successively threaded said filaments which are partly embraced by said oxidizing furnace maintained at 180° C. to an oxidizing treatment temperature, said apparatus comprising:

(a) a pair of chain wheels provided at the both ends of each of said rollers freely rotatable against said rollers;

(b) a pair of chains which engage successively said chain wheels at the both ends of each of said rollers and turn in a zigzag manner around one roller after another;

(c) a chain-drive means to move said chains from the entrance to the exit of said oxidizing furnace;

(d) limit switches located to match the shrinkage and elongation behavior of said filaments within said oxidizing furnace, said limit switches acting with progress of said chains;

(e) a working rod provided as one part of said chains and serving to manipulate said limit switches;

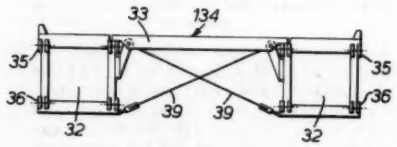
(f) a filament-fastening bar installed between said paired chains; and

(g) a speed control means to adjust the speed of said chains driven by said chain-drive means according to the changing behavior of said filaments, based on signals issued from said limit switches worked by said working rod.

4,521,932
TRANSPORTABLE BRIDGE STRUCTURE

Thomas S. Parramore, Bournemouth, England, assignor to Fairey Engineering Limited, Stockport, England

Filed Dec. 7, 1982, Ser. No. 447,550
Claims priority, application United Kingdom, Dec. 8, 1981, 8137003
Int. Cl.[3] E01D 15/12
U.S. Cl. 14—2.4 23 Claims



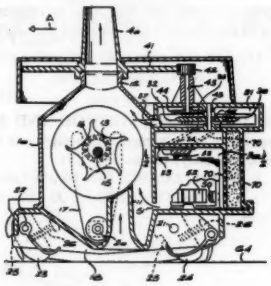
1. A bridge module comprising two longitudinal main girder structures and a central deck having a deck surface capable of supporting vehicles, and the central deck extending substantially the entire length of the module, foldable connecting means foldably connecting said main girder structures to each side of said central deck in a manner such that said main girders are foldable between an operative position in which said main girder structures provide extensions of said deck surface on

either side of said central deck for use, and a closed position in which said main girder structures are folded beneath said deck.

4,521,933
RANDOM STEERING DEVICE FOR A SUBMERGED SUCTION CLEANING HEAD

Johann N. Raubenheimer, Johannesburg, South Africa, assignor to Johann Nicolaas Raubenheimer, Johannesburg, South Africa

Continuation of Ser. No. 422,160, Sep. 23, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 604,450
Claims priority, application South Africa, Sep. 24, 1981, 81/6630; Apr. 2, 1982, 82/2293
Int. Cl.³ E04H *3/20*
U.S. Cl. 15—1.7 **3 Claims**

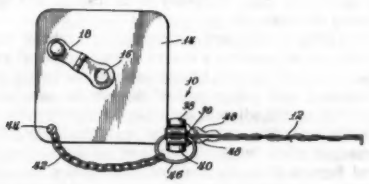


1. A suction cleaning device for cleaning submerged surfaces connected to a suction system by means of a flexible suction hose comprising: a housing adapted to be caused to travel over a surface to be cleaned, a spigot attached to said suction hose and journalled in the housing for rotation relative to the housing and having its axis normal to the surface in use; a drive gear fixed to the spigot; a passage through the housing to provide a first path of flow for liquid flowing to the suction hose; a first turbine in the housing rotated by flow of liquid through the passage; inclined friction feet pivoted on the housing and biased in a position to be actuated by the first turbine to cause the housing to move by a rocking action; a bypass passage through the housing to provide a second path of flow for liquid flowing to the suction hose; a second turbine positioned in the bypass and caused to rotate by liquid flowing in the bypass; a gear train between the second turbine and the drive gear; and means for intermittently blocking and unblocking the bypass so that the second turbine applies torque to the drive gear intermittently and for short periods of time.

4,521,934
TAPE WIPER

Gary Castle, 4811 Forster, Schiller Park, Ill. 60176

Filed Nov. 25, 1982, Ser. No. 555,137
Int. Cl.³ A47L *17/06*
U.S. Cl. 15—236 R **9 Claims**



1. A portable device for cleaning the surfaces of a long, flexible tape as the tape is wound through a guide into a hub, comprising

a. a pair of jaws extending across the tape, said jaws being complementary to one another and each jaw being shaped to engage an opposite surface of the tape with the tape located between the jaws when the jaws are closed,

b. means hingedly secured the jaws together at one end thereof,

c. each jaw including a portion of an interlocking tip, said tips being located at an end of said jaws opposite to said securing means, and said tips interlocking when said jaws are closed to contain said tape between the confines of the combination of said tips, said jaws and said securing means,

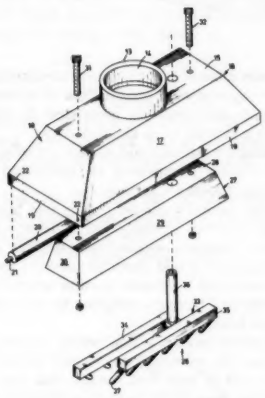
d. means resiliently urging said jaws toward one another to close said jaws about the tape, and

e. means on each jaw for stripping undesired debris from the tape as the tape is wound onto a hub.

4,521,935
VACUUM SPRAY HEAD

Charles R. Johnston, Wilmington, N.C., and Gregory M. Green, Port St. Lucie, Fla., assignors to Container Products Corp., Wilmington, N.C.

Filed Aug. 29, 1983, Ser. No. 527,256
Int. Cl.³ A47L *11/34*
U.S. Cl. 15—322 **4 Claims**



1. A vacuum spray head for a cleaning apparatus adapted to clean grate type surfaces with the apparatus having a heated cleaning fluid source and a vacuum recovery system, wherein the improvement comprises,

(a) a hood having a top wall and side and end walls extending downwardly and outwardly therefrom and terminating in a depending peripheral flange,

(b) a shield carried within and spaced from said hood,

(c) means providing communication between the vacuum recovery system and the space between said hood and said shield,

(d) elongated rollers of a length greater than said shield and carried by said peripheral flange of said end walls and extending in parallel relation to the side walls within said hood for rolling engagement with the parallel slats of a grate to be cleaned,

(e) a fluid dispensing means within said shield extending parallel to said elongated rollers for dispensing cleaning fluid simultaneously in opposite parallel directions to said rollers onto the opposite sides of the slats of the grate to be cleaned,

(f) means connecting said fluid dispensing means to the heated cleaning fluid source, and

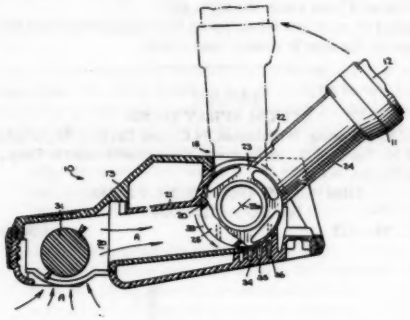
(g) means extending between said hood and said shield for adjustably positioning said shield and said fluid dispensing means within said hood in a direction perpendicular to said elongated rollers so as to vary the distance of said fluid dispensing means to the side of the slats of the grate to be cleaned.

4,521,936

SELF-CLEANING JOINT

Peter M. Medwed, Pound Ridge, N.Y., assignor to Electrolux Corporation, Stamford, Conn.

Filed Sep. 30, 1983, Ser. No. 537,643
Int. Cl.³ A47L 5/00
U.S. Cl. 15—377 **10 Claims**



1. A vacuum cleaner power nozzle, comprising:
a body having a passage for the flow of air therethrough;
means within said passage, supported by said body, for agitating a surface to be cleaned; and
power means for driving said surface agitating means;
said body further comprising an articulated joint in said passage, said joint comprising:
a chamber having walls defined by said body, and
a tubular member having outer walls and having a first portion disposed within said chamber and rotatable about an axis in said chamber between first and second positions, and a second portion extending from said chamber and having a coupling for attaching a vacuum cleaner hose,
said chamber having a first recess in said wall of said chamber for collecting dust which enters between said outer wall of said first portion and said wall of said chamber, said recess being positioned such that dust collected therein is removed by the flow of air through said passage when said first portion is in said second position.

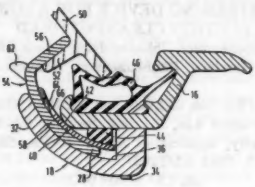
4,521,937

HINGE COMPRISING AN ARCUATE SPADE MEMBER AND AN ARCUATE SOCKET

Sidney E. Fisher, Birmingham, England, assignor to Britax Weathershields Limited, England

Filed Jun. 14, 1983, Ser. No. 504,281
Claims priority, application United Kingdom, Jun. 25, 1982, 8218536; Feb. 14, 1983, 8303953
Int. Cl.³ E05D 11/10, 1/04
U.S. Cl. 16—332 **6 Claims**

1. A hinge for mounting a panel in an opening comprising a spade member secured to one surface of the panel and a socket portion secured to an edge of the opening, the spade member having an arcuate portion projecting from said surface in an arc centred on a desired hinge axis, and the socket portion having an open-ended arcuate channel, centred on said desired hinge axis and at least one wall of said channel being formed by a wall member mounted on resilient means which, when relaxed, causes the width of the part of said channel to be less than the thickness of the arcuate portion of the spade member, the wall member being pivoted at an intermediate point on a rigid fulcrum spaced from a wall of the channel opposite to the



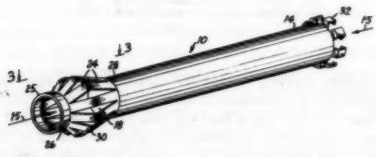
wall member by a distance such that the spade member is a sliding fit therein, and the resilient means is arranged to pivot the wall member on said fulcrum so as to reduce the width of the inner end of the channel and increase the width of the outer end thereof.

4,521,938

CASING SIZING MEANS, METHOD AND APPARATUS

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 23, 1983, Ser. No. 507,006
Int. Cl.³ A22C 11/00
U.S. Cl. 17—49 **15 Claims**



1. Sizing means for use in diametrically stretching a food casing prior to the stuffing thereof, said sizing means comprising:
(a) a substantially rigid tubular member of a size sufficient to fit slidably over a stuffing horn of a stuffing apparatus and within a casing to be stuffed;
(b) a plurality of longitudinally extending sizing fingers formed from the wall of said tubular member by a plurality of slits spaced about the periphery thereof, said slits being coextensive and extending longitudinally of said tubular member; and
(c) hinge means intermediate the ends of each sizing finger, said hinge means being arranged to permit the in unison movement of a midportion of each of said sizing fingers to an outwardly spaced position responsive to an axial compression of said tubular member, said sizing fingers, with the midportions thereof spaced outwardly, being radially expanded to a size sufficient to diametrically stretch a casing to be stuffed.

15. A method of diametrically expanding a food casing about a stuffing horn outlet by engaging an expandable internal sizing means against the inner periphery of the casing, said method comprising the steps of:
(a) providing a casing article constituting a tubular member having an aft portion, a shirred casing on the aft portion with the shirred casing having an unshirred casing portion extending over a fore end of the tubular member, said member having adjacent its fore end a plurality of longitudinally extending, substantially unyielding sizing fingers arranged about the outer periphery of the stuffing horn, and formed from the wall of said tubular member by co-extensive longitudinal slits, each of said sizing fingers including an intermediate portion which is articulated for

radial movement with respect to the longitudinal axis of said stuffing horn to and from a casing stretching position;

(b) mounting said casing article to said stuffing horn by fixing a first end of said tubular member with respect to the longitudinal axis of said stuffing horn;

(c) longitudinally adjusting a second end of said tubular member along said stuffing horn towards and away from said first end; and

(d) flexing each of said sizing finger intermediate portions in unison radially outwardly against the inner surface of the unshirred casing portion to a casing stretching position in direct response to the longitudinal adjustment of said tubular member second end towards said first end, the amount of said radial movement being determined by the extent of said longitudinal adjustment.

4,521,939

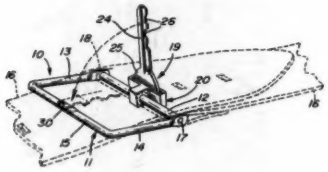
BELT BUCKLE

Carol Chabot, and Ovila Chabot, both of 75 du Collège St., Pont-Rouge, Canada (G0A 2X0)

Filed Dec. 28, 1983, Ser. No. 566,472

Int. Cl.³ A44B *11/24*

U.S. Cl. 24—188 **1 Claim**



1. A belt buckle comprising an open frame including a pair of opposite lateral frame portions and a pair of opposite transverse frame portions peripherally extending around the central belt passage, one of said transverse frame portions adapted to be attached to one end of a belt, a lock key-securing member mounted for rotation about said one transverse fame portion, said key-securing member having a T-shape and including a leg and a flat sleeve forming the cross-leg of said T-shaped member, said leg having a transverse bore receiving said one transverse frame portion, said sleeve overlying said one transverse frame portion, being open at both ends, said ends lying in planes parallel to said one transverse frame portion, said sleeve having a rectangular shape with its longitudinal axis generally parallel to said one transverse frame portion, said belt adapted to be used in association with a lock key of the type having a head and a notched stem for actuating a key-actuated lock, said sleeve adapted to receive the head of said key, and further including means carried by said sleeve for adjustably securing said head of said key within said sleeve, with the outer end of the stem of said key adapted to abut against said other transverse portion.

4,521,940

HOSE CLAMP

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen, Switzerland

Filed Feb. 23, 1982, Ser. No. 351,549

Int. Cl.³ F16L *33/04*

U.S. Cl. 24—282 **22 Claims**

1. A clamp which comprises a clamping band having two ends and threaded means for tightening the clamping band about an object to be fastened, said threaded means including a first member retained near one band end, a second member retained near the other band end, said first and second members being each provided with through-bores, and a screw member having a screw head larger than the through-bore of the first member and a threaded portion adapted to extend at least through the through-bore of said first member and operable to tighten the clamp by drawing together the first and second members and thereby reduce the diametric dimension of the clamp, characterized in that one band end extends beyond the area of the threaded means underneath the overlapping band portion of the other band end to cover the resulting gap underneath the threaded means and thereby prevent the bulging-out of the object to be fastened into the gap, and further means within the area of overlap between said one band end and the otherlapping band portion near the other band end to provide a substantially stepless transition in the circumferential direction between said one band end and the adjoining band portion, and the first and second members being of at least approximately part-cylindrical shape rotatably retained in pocket-like loops of at least approximately complementary, part-cylindrical shape to enable positional adjustment of said members during tightening of the clamp.

4,521,941

CORNER FITTING FOR FREIGHT CONTAINERS

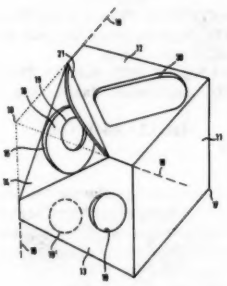
Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwälder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,556

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048718; Apr. 23, 1981, 3116254

Int. Cl.³ B65D *88/12, 90/08*

U.S. Cl. 24—287 **49 Claims**



1. Corner fitting for freight containers comprising:

three mutually perpendicular side walls connected to one another to form a section of a corner of a cube having its apex pointing outwardly from a freight container when in an in use position,

and an oblique triangular surface extending tranversely to a diagonal through the corner apex and joining the three side walls,

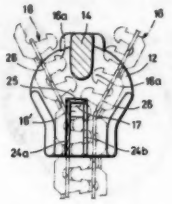
said triangular surface and at least one of said side walls including openings for container handling elements.

4,521,942

LOCKABLE SLIDE FASTENER SLIDER

Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,007
Claims priority, application Japan, Mar. 6, 1982, 57-31883[U]
Int. Cl.³ A44B *19/30*
U.S. Cl. 24—419 **5 Claims**



1. A lockable slider for a slide fastener having a pair of rows of coupling elements, said slider comprising:

(a) a slider body including a pair of first and second wings joined at one end by a neck to define therebetween a substantially Y-shaped guide channel for the passage therethrough of the pair of coupling element rows, said first wing having an aperture communicating with said guide channel and bounded by a peripheral wall, said first wing having in its inside surface an elongated groove extending from said aperture to the opposite end of said first wing, said groove being defined jointly by a bottom wall and a pair of oblique sidewalls diverging toward said guide channel, said bottom wall having a width substantially the same as that of said aperture, said peripheral wall having an oblique end portion facing said guide channel and merging into said oblique sidewalls;

(b) a pull tab pivotably connected to said first wing; and

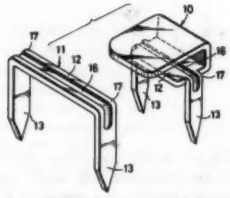
(c) a locking element operatively connected to said pull tab and movable through said aperture into and out of locking engagement with at least one coupling element of the pair of coupling element rows in said guide channel.

4,521,943

FASTENING FOR A GARMENT

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,063
Claims priority, application Japan, Sep. 20, 1982, 57-142436[U]
Int. Cl.³ A44B *1/42*
U.S. Cl. 24—689 **7 Claims**



1. A hook and eye for use on a garment, said hook being receivable in said eye when assembled onto the garment, comprising:

(a) a pair of hasps having at least two apertures;

(b) a hook base and an eye base, each said base having at least two spikes initially projecting from said base for being pierced through the garment into the apertures of one of said hasps, and for being deflected into a clenched condition against one of said hasps; and

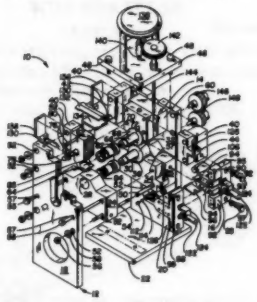
(c) means disposed around a joint between each said base and said spikes for opposing deformation of either of said hook and eye around said joint when said spikes are pierced and clenched, each of said means comprising a cold-pressed groove opening outwardly and extending longitudinally across said joint, said hook and eye each thereby having a greater hardness in a region around said grooves than at other regions thereof.

4,521,944

DOWEL-ALIGNED MULTIPLE PLATE STUFFER BOX CRIMPER CONSTRUCTION FOR FILTER TOW

Bruce W. Stockbridge, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,186
Int. Cl.³ D02G *1/12*
U.S. Cl. 28—264 **10 Claims**



1. A stuffer box crimper for crimping filament tow and including upper and lower crimper rolls each including a shaft extending from each side of the crimper roll along the axis thereof, upper and lower scraper blades spaced apart from each other and defining therebetween a crimping chamber, and a clapper mounted for movement within said crimping chamber, said stuffer box crimper comprising

(a) a main frame assembly forming a support for said stuffer box crimper and defining a pair of journalled seats for the shaft of the lower crimper roll,

(b) a sub-frame assembly movably mounted within said main frame assembly and defining a pair of journalled seats for the shaft of the upper crimper roll, and

(c) a crimper chamber assembly mounted for movement into and out of said main frame assembly and including said upper and lower scraper blades and said clapper,

each of said main frame, sub-frame and crimper chamber assemblies being comprised of multiple precision ground plates held together in side-by-side contacting relationship, each plate having plate-contacting side face surface area(s) sufficient in extent to stabilize the plate in a non-rocking relation to the plate-contacting side face surface area(s) of an adjacent plate with which it is in contact and defining a predetermined number of bore holes formed through the plate and spaced in a predetermined manner, said assemblies having a corresponding number of dowel pins for close sliding relationship with said bore holes for precisely orienting and aligning said multiple precision ground plates with respect to each other, and including bolt members for holding said plates of each said assembly in said precise alignment, and

said multiple plates of said main frame assembly and of said sub-frame assembly and of said main frame assembly and of said crimper chamber assembly defining cooperating guide means therebetween for enabling (1) said sub-frame assem-

bly and its supported upper crimper roll to be slidably moved in a vertical plane at right angles to the axis of said lower crimper roll toward and away from said lower crimper roll for adjustment of the nip between said upper and lower crimper rolls, and (2) said crimper chamber assembly to be aligned within said main frame assembly.

4,521,945

YARN BULKING JET

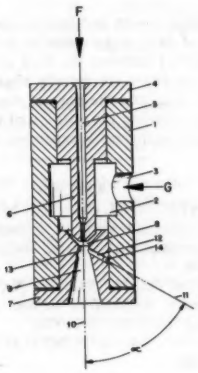
Peter Heinen, and Peter Gossens, both of Heinsberg-Oberbruch, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 106,591, Dec. 26, 1979, abandoned. This application Oct. 9, 1981, Ser. No. 310,188

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856291

Int. Cl.³ D02G *1/16*

U.S. Cl. 28—273 **5 Claims**



1. Bulking device for the production of loop yarn comprising a base forming a blowing chamber with a connection for blowing medium, a pin insert with a yarn feed channel aligned coaxially to the bulking device axis extending into the blowing chamber, the pin insert having a conically pointed tip, a jet insert with a yarn delivery channel extending from the opposite end into the blowing chamber, with a conical taper on the inlet side relative to said conical tip, a diffusor being connected to the smallest cross section thereof, whereby the conically pointed bulking pin extends into the conical taper of the jet insert, further comprising a resonance chamber (12), closed at its outer end, leads into diffusor (9) just behind the inlet cross section of the latter (13).

4,521,946

CUTTER AND BELT TYPE CONVEYOR FOR WIRE SEGMENTS

Robert O. Dusel, Brookfield, and Gerald E. Blaha, Waukesha, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Division of Ser. No. 363,968, Mar. 31, 1982, Pat. No. 4,502,586. This application Jan. 23, 1984, Ser. No. 572,984

Int. Cl.³ H01R *43/04*

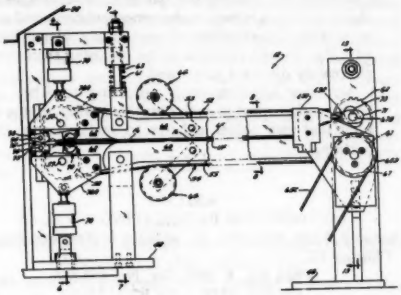
U.S. Cl. 29—33 M **3 Claims**

1. In combination:

means for cutting a continuous strand of wire moving along a first path into segments;

and conveyor means for receiving and conveying said segments along a second path transverse to said first path while maintaining each segment so that its longitudinal axis is transverse to said second path;

said conveyor means comprising a driven pair of endless belts having confronting flights movable along said second path;



said conveyor means further comprising means for periodically separating and reclosing a portion of said confronting flights to facilitate reception of a wire segment therebetween for conveyance.

4,521,947

METHOD FOR MANUFACTURING A CATALYTIC REACTOR CARRIER MATRIX

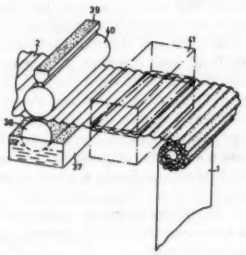
Manfred Nonnenmann, Schwieberdingen; Heinrich Oltmanns, Eberdingen, and Manfred Hohhäusel, Stuttgart, all of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG., Fed. Rep. of Germany

Continuation of Ser. No. 156,486, Jun. 4, 1980, Pat. No. 4,381,590. This application Sep. 30, 1982, Ser. No. 428,452

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1979, 2924592

Int. Cl.³ B23P *13/00*

U.S. Cl. 29—157 R **5 Claims**



1. In a method for manufacturing a carrier or supporting matrix for a catalytic reactor designed for cleaning or purifying the exhaust gases in an internal combustion engine of a motor vehicle, the reactor comprising high temperature resistant steel sheets coated with a catalyst material, said steel sheets comprising a first relatively flat sheet and a second corrugated sheet alternately disposed in layers, the individual layers of the steel sheets being soldered together, the improvements comprising:

(a) providing at least a cleaned portion of each of said flat and corrugated steel sheets;

(b) applying a binding agent to the flat sheet along selected areas of said cleaned portion thereof;

(c) applying a predetermined amount of pulverent solder to the selected areas on which binding agent has been applied, said selected areas being strips extending in the direction of corrugations of the corrugated steel sheets, or at right angles thereto, so that solder is present only in the

vicinity of said strips and a substantial area intermediate the strips is free of solder;

(d) subsequently coiling the flat and the corrugated steel sheets to form a honeycomb element wherein said selected areas with a predetermined amount of solder thereon are adjacent cleaned portions of the opposing surface of said alternately disposed sheet; and

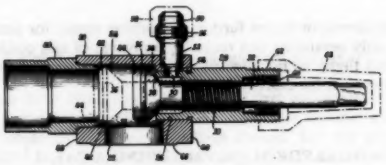
(e) thereafter sumultaneously soldering together all the layers with respect to each other by heating up the matrix such that said solder adheres to said adjacent cleaned portion.

4,521,948

METHOD FOR FABRICATING A VALVE

Charles E. Laue, Wilmette, Ill., assignor to Hamilton-Pax, Inc., Chicago, Ill.

Filed Feb. 3, 1983, Ser. No. 463,536
Int. Cl.³ B21K *1/20*; B23P *13/00*
U.S. Cl. 29—157.1 R **3 Claims**



1. A method of making a valve comprising the steps of forming a body wiith six walls by cutting from a substantially hexagonal steel bar a segment which is thinner than the minimum width of the hexagonal cross-section of the body, drilling a round chamber in one side of the body spaced from its opposite side and from said walls, drilling two substantially coaxial holes into said chamber from two oppositely facing of said walls, respectively, one of said holes being of larger diameter than the other, fitting an internally threaded steel sleeve into the smaller-diameter of said holes, with its inner end defining a back seat, drilling a charging port into said other side of said body with a smaller-diameter portion of said port extending through said body and through said sleeve at a point spaced outwardly from said chamber and inwardly of the sleeve's threads, inserting a valve stem through the larger-diameter of said holes and threading it into said sleeve until a head on one end of said stem is within said chamber with the other end of the stem projecting beyond said sleeve for actuation of the head, fitting a steel charging nipple into said port until it seats against the body around said smaller-diameter portion of said port at an area spaced from said sleeve, fitting another steel sleeve into the larger-diameter of said holes to define a front seat at the inner end of said other sleeve, said head being alternately engageable with the inner ends of respective sleeves to alternately engage one seat, while disengaging the other said head when disengaged from the back seat opening the charging port to said chamber, and then brazing said sleeves and nipple simultaneously to said body around said holes and said port, respectively.

4,521,949

METHOD OF LOOSENING AND ADJUSTING TIGHTLY-JOINED ELEMENTS

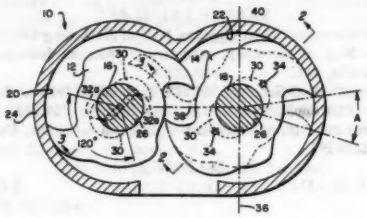
James M. Aumick, Addison, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 20, 1983, Ser. No. 459,306
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—446 **8 Claims**

1. A method of loosening and adjusting tightly-joined elements, in which a first one of the elements comprises a rotor which has a bore formed therein which is tightly fitted about a mating surface of a second element, such as a shaft or the like, wherein the rotor has a first quadrant of a given mass, and a second quadrant of a mass which is less than said given mass, comprising the steps of:

introducing a fluid under pressure between the bore of the first element and the mating surface of the second element; wherein said fluid-introducing step comprises

introducing a given quantity of fluid under pressure between the bore and the mating surface whereat the latter are



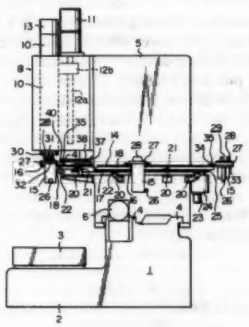
radially aligned with said first quadrant, and introducing a quantity of fluid under pressure which is less than said given quantity between the bore and the mating surface whereat the latter are radially aligned with said second quadrant to expand the bore of the rotor relative to the shaft, and adjusting the position of the rotor on the shaft while the bore thereof is expanded relative to the shaft.

4,521,950

AUTOMATIC TOOL CHANGE MACHINE TOOL

Hiroshi Kase, Takatsuki; Yoshiaki Matsumoto, Mino, and Kouji Ohkawa, Toyonaka, all of Japan, assignors to O-M Limited, Osaka, Japan

Filed Jul. 30, 1982, Ser. No. 403,543
Claims priority, application Japan, Aug. 13, 1981, 56-127347[U]; Aug. 13, 1981, 56-120741
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **16 Claims**



1. An automatic tool change machine tool comprising:

a machine bed;

a worktable mounted on the machine bed;

a vertical column mounted on said machine bed and having a tool stock disposed at an upper part of said vertical column;

a vertically moveable tool bar received in said tool stock having at a lower part thereof means for receiving a toolholder, said toolholder receiving means being provided at the lowermost part thereof with a tool receiving bore having a conical tapered face;

a draw bar vertically movably arranged in said tool bar for pulling a toolholder toward and releasing the toolholder from said receiving means of said tool bar, said draw bar

having at the lowermost end thereof a toolholder engagement means;

a magazine in the shape of an annular plate turnably mounted on said vertical column so as to be turnable about a vertical axis in a horizontal plane, said magazine having a plurality of toolholder receptacles arranged in the outer circumference thereof;

a plurality of toolholder supports, each being retractably arranged on each said toolholder receptacle and having a retraction permitting means at an inner base portion of each said toolholder supports, each of said toolholder supports being a plate-like fork member having parallel prongs interconnected with one another by an inner base portion;

a plurality of toolholders each holding a cutting tool and removably stored in said toolholder receptacles of said magazine, each said toolholder having a lateral extension means engageable with the corresponding toolholder support arranged on said toolholder receptacle, an upper tapered part capable of being complementary fitted in said tool receiving bore of said toolholder receiving means of said tool bar, and an engagement means capable of being engaged with said toolholder engagement means of said draw bar;

an indexing means for indexing each of said plurality of receptacles of said magazine to a predetermined tool change position where a toolholder is attached to or detached from said toolholder receiving means of said tool bar; and

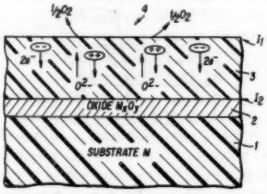
an actuating means for actuating the retraction of each said toolholder support from a corresponding receptacle and the pushing of each said toolholder support onto a corresponding receptacle while the corresponding receptacle of said toolholder magazine is indexed to said predetermined tool change position, said actuating means including an extendable and retractable piston rod having at the outermost part a recessed portion engageable with said retraction permitting means when said piston rod is in an extended position.

4,521,951

METHOD OF REDUCTION OF A COMPOUND FORMING A LAYER ON A SUBSTRATE AND THE APPLICATION OF SAID METHOD TO THE FABRICATION OF A FIELD-EFFECT SEMICONDUCTING STRUCTURE

Michel Croset, and Louis Mercandalli, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 23, 1983, Ser. No. 506,994
Claims priority, application France, Jun. 25, 1982, 82 11215
Int. Cl.³ H01L *21/20, 21/31*
U.S. Cl. 29—571 **18 Claims**



1. A method of fabricating a semiconducting structure comprising reducing at least one layer of oxidized compound containing a predetermined chemical species, which layer covers at least part of the surface of a semiconducting substrate, said reduction being conducted in a first step comprising covering the surface of said substrate with a layer of a solid electrolyte which is an ionic conductor for said predetermined chemical species, followed by a second step comprising carrying out said reduction through said layer of solid electrolyte.

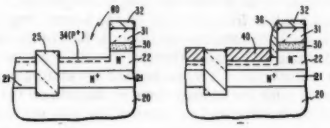
18. A method of fabrication of a field-effect semiconducting structure of the MIS type comprising the steps of the method of reduction according to claim 1, including an additional step carried out after the second step of the method of reduction and consisting in deposition of a metal zone which covers predetermined regions of the surface of the solid electrolyte layer in order to form a stack of at least one layer of reduced semiconductor, a dielectric layer formed by the solid electrolyte layer and a metal layer, said stack constituting the MIS structure.

4,521,952

METHOD OF MAKING INTEGRATED CIRCUITS USING METAL SILICIDE CONTACTS

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,156
Int. Cl.³ H01L *21/265, 21/24;* C23F *1/02*
U.S. Cl. 29—590 **15 Claims**



1. Method for making an electrical contact having a significant side component to a silicon semiconductor device comprising:

forming a metal silicide contact on the surface of a silicon body;

thermally oxidizing the surface of said metal silicide to form a silicon dioxide layer thereover and resulting in moving said metal silicide contact into said silicon body to the extent that said side contact component is formed greater than about 50 nanometers in depth;

forming an opening in said silicon dioxide layer to said metal silicide; and

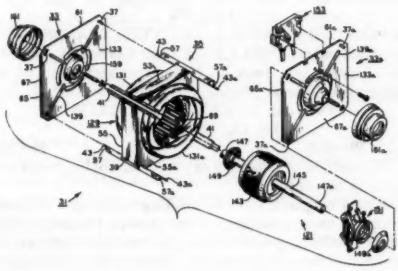
making electrical contact to said metal silicide contact.

4,521,953

METHOD OF ASSEMBLING A DYNAMOELECTRIC MACHINE

James L. King, and John E. Hennessy, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 10, 1984, Ser. No. 598,902
Int. Cl.³ H02K *15/14*
U.S. Cl. 29—596 **33 Claims**



1. A method of assembling a dynamoelectric machine having at least one end frame and a stator assembly, the at least one end frame including a pair of opposite faces, and a set of aper-

tures having sidewalls intersecting with the opposite faces, respectively, and the stator assembly including a stator core having a bore therethrough, a set of beams mounted to the stator core and extending in generally axial directions therefrom, at least one set of abutments on the beams, a set of tabs extending from the abutments and sized predeterminately smaller than the sidewalls of the apertures in the at least one end frame, and a set of yieldable sections in the tabs predeterminately located between a free end portion of the tabs and the abutments on the beams, respectively, the method comprising the steps of:

arranging the apertures in the at least one end frame about the tabs on the beams and extending the tab free end portions beyond one of the opposite end faces of the at least one end frame, respectively;

seating the other of the opposite end faces of the at least one end frame in engagement with at least some of the abutments on the beam;

adjusting the at least one end frame generally radially on the beams into an assembly position with respect to the stator core when the other opposite end faces of the at least one end frame is seated against the at least some abutments in the beams and arranging thereby the sidewalls of the apertures in the at least one end frame generally in spaced apart relation from the tabs on the beams, respectively;

applying a force onto the one opposite face of the at least one end frame and urging thereby the other opposite face of the at least one end frame toward the seating engagement thereof with the at least some abutments on the beams;

displacing the free end portions of the tabs generally about the yieldable sections therein into overlaying relation with confronting parts of the at least one end frame on the one opposite face thereof and at least in part retaining thereby the at least one end frame against axial displacement from its assembly position on the beams with respect to the stator core, respectively;

deforming generally simultaneously a set of overlaying sections from the tab free end portions and the confronting parts of the at least one end frame in the overlaying relation thereof and interlocking one of the deformed overlaying sections with one of the tab free end portions and the confronting parts of the at least one end frame in the overlaying relation thereof so as to retain the at least one end frame against rotational and radial displacement from its assembly position on the beams with respect to the stator core, respectively; and

maintaining the spaced apart relation between the tabs on the beams and the sidewalls of the apertures in the at least one end frame during both the displacing and retaining step and the deforming and interlocking step without retaining the at least one end frame against rotational and radial displacement from its assembly position with respect to the beams other than the force applied onto the at least one end frame in the applying and urging step, respectively.

4,521,954

METHOD FOR MAKING A DRY TYPE TRANSFORMER

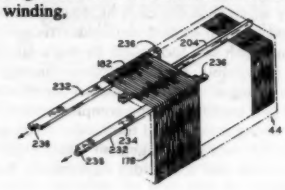
Leo C. Rademaker; Philip J. Hopkinson; Gordon M. Bell, all of Fort Wayne, and Noah D. Hay, Huntertown, all of Ind., assignors to General Electric Company, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,735
Int. Cl.³ H01F *41/06*
U.S. Cl. 29—605 **15 Claims**

1. The method of making a dry type air cooled transformer comprising the steps of:

forming a magnetic core by stacking a plurality of laminations to form a plurality of interleaved lamination layers each comprising a pair of leg portions and a pair of yoke portions connecting the leg portions, the yoke and leg portions being connected end to end and surrounding a core window, each of the leg and yoke portions comprising a plurality of stacked said laminations each having a favored magnetic direction extending lengthwise of the lamination, at least some of the leg and yoke laminations in each layer having a mitered end placed in abutment with a mitered end of an adjacent leg by a yoke portion, the abutting mitered ends forming core joints extending at an angle to the favored magnetic directions of the respective abutting laminations,

forming a coil comprising a plurality of superimposed layers of wound conductor by winding a conductor about a form and placing duct spacers between at least certain of the conductor layers in end portions of the coil during winding to space the certain layers apart thereby forming a plurality of air ducts through the coil end portions, each conductor layer being wound in a rectangular configuration having four corners at which the conductor is bent during winding,



the duct spacers extending through the ducts and being spaced apart from the conductor corners in the respective ducts to provide a pair of air channels in each duct contiguous with the respective conductor corners,

compressing side portions of the coil not having duct spacers therein to compress together the conductor layers therein and reducing the thickness of the side portions in the area of the coil window,

while continuing to compress the side portions, bonding the compressed conductor layers together to retain the coil sides in their compressed states, and then

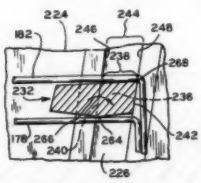
mounting the coil on a leg portion of the core with one of the coil compressed sides being disposed in the core window.

4,521,955

METHOD OF MAKING A DUCTED DRY TYPE TRANSFORMER

James M. Closson, Harlan, and Noah D. Hay, Huntertown, both of Ind., assignors to General Electric Company, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,738
Int. Cl.³ H01F *7/06*
U.S. Cl. 29—605 **29 Claims**



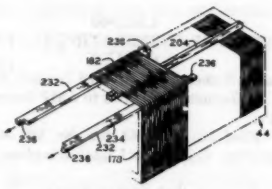
1. A method of making a dry type air cooled transformer comprising: forming a coil by winding a plurality of turns of conductor about a coil axis to form a first coil layer, placing first and second duct spacers over the first coil layer on one end of the coil, the duct spacers being spaced apart in the circumferential direction relative to the coil axis, tightly winding a plurality of turns of conductor on the first coil layer over the duct spacers to form a second coil layer, the duct spacers spacing the second layer from the first layer to form an air duct

in the coil one end, then placing third and fourth duct spacers over the second coil layer directly over the first and second spacers, respectively, in a direction outward from the coil axis; tightly winding a plurality of turns of conductor on the second coil layer over the third and fourth duct spacers to form a third coil layer, the third and fourth duct spacers spacing the third coil layer from the second coil layer to form a second air duct; then loosening each of the first and third duct spacers by moving a surface thereof in a direction to provide clearance between the first and third spacers and the first, second and third coil layers and sliding the first and third duct spacers axially out of the coil and leaving the second and fourth duct spacers in place, the step of loosening the first spacer occurring before the step of sliding the first spacer out of the coil is commenced and the step of loosening the third spacer occurring before the step of sliding the third spacer out of the coil is commenced; and placing the coil on a magnetic core.

4,521,956
METHOD FOR MAKING A TRANSFORMER HAVING IMPROVED SPACE FACTOR

Gordon M. Bell, and Philip J. Hopkinson, both of Fort Wayne, Ind., assignors to General Electric Company, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,886
Int. Cl.³ H01F *41/06*
U.S. Cl. 29—605 **15 Claims**



1. A method of making a dry type air cooled transformer comprising:

providing a magnetic core having at least two legs and a core window between the legs,

forming a rectangular coil comprising a plurality of superimposed layers of wound conductor surrounding a vacant coil window with adjacent conductor layers separated from each other by respective layers of sheet-like insulation material having a bonding material on both sides thereof, the layers being bent at four corners during winding,

inserting duct spacers between at least some of the conductor layers in an end portion of the coil during formation of the coil to space the layers apart in the end portions thereby providing air ducts in the coil extending generally parallel to the layers for the passage of cooling air, the duct spacers spaced from said corners to form a pair of air channels in each duct, said channels being contiguous to respective coil corners,

clamping at least one side of the coil to exert compression forces thereon in a direction normal to the conductor layers and insulation layers in the one side thereby compressing together the conductor layers and insulation on said one side of the coil,

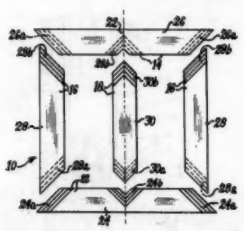
while continuing to exert the compression forces, altering the physical properties of the bonding material to bond the adjacent conductor layers to the insulation layers therebetween to form a permanently compressed coil side, unclamping the coil, and then

placing one of the core legs inside the coil window such that the compressed side of the coil is disposed in the core window.

4,521,957
METHOD OF CONSTRUCTING A MAGNETIC CORE

Ramon M. McLeod, Rome, Ga., assignor to General Electric Company, King of Prussia, Pa.

Continuation of Ser. No. 355,785, Mar. 8, 1982, abandoned. This application May 11, 1984, Ser. No. 608,550
Int. Cl.³ H01F *41/02*
U.S. Cl. 29—609 **5 Claims**



1. A method of constructing a magnetic core comprising the steps of:

A. providing a plurality of first laminations each having mitered ends and parallel sides to present a trapezoidal configuration, said first laminations having equal lengths;

B. providing a plurality of second laminations each having mitered ends and parallel sides to present a trapezoidal configuration, said second laminations having incrementally varying lengths;

C. arranging a plurality of said second laminations in a first stacked group with their mid-length points in registry such as to present visible stepped-lap joint halves at each end of said first group;

D. arranging a plurality of said second laminations in a second stacked group with their mid-length points in registry such as to present concealed stepped-lap joint halves at each end of said second group, the number of said second laminations in each said second stacked group being equal to the number of said second laminations in each said first stacked group;

E. arranging said first laminations in plural stacked third groups with the mid-length points thereof incrementally, longitudinally offset to present visible stepped-lap joint halves and concealed stepped-lap joint halves at opposite ends of each of said third groups, the number of said first laminations in each said stacked third group being equal to the number of said second laminations in each said second stacked group;

F. assembling a pair of said third groups to said first group such that said concealed stepped-lap joint halves at corresponding one ends of said third group pair are respectively joined with the visible stepped-lap joint halves at the two ends of said first group;

G. assembling said second group to said third group pair such that said concealed stepped-lap joint halves at the two ends thereof are joined with the visible stepped-lap joint halves at the corresponding other ends of said joint group pair; and

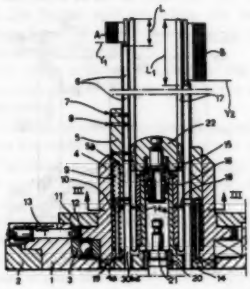
H. repeating steps F. and G. a requisite number of times to complete the build of said core.

4,521,958

PRE-WOUND COILS INSERTING DEVICE FOR USE IN THE MANUFACTURE OF DYNAMO-ELECTRIC MACHINES

Giorgio Barrera, Leumann, Italy, assignor to Officine Meccaniche Pavesi & C. S.p.A., Turin, Italy

Filed Oct. 28, 1983, Ser. No. 546,358
Claims priority, application Italy, Oct. 28, 1982, 68261 A/82
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—734 10 Claims



1. A device for inserting pre-wound coils into stator slots of dynamo-electric machines, comprising:

an annular series of coil-guide blades having free ends intended to receive the pre-wound coils to be inserted into the stator slots,

an annular series of wedge-guide blades surrounding the coil-guide blades and having free ends terminating a short distance before the free ends of the coil-guide blades in such a way as to allow the stator to rest on the free ends of the wedge-guide blades by positioning it around the coil-guide blades,

a thrust member slidable through the series of coil-guide blades for inserting the coils into the stator slots,

said wedge-guide blades being axially displaceable in a direction away from their free ends, and

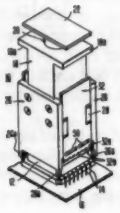
resilient means urging said wedge-guide blades in the direction of the free ends thereof.

4,521,959

DEVICE FOR THE CONTROLLED EXTRACTION OF ELECTRONIC CIRCUIT COMPONENTS

George J. Sprenkle, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 5, 1983, Ser. No. 510,754
Int. Cl.³ H05K *13/04*
U.S. Cl. 29—741 10 Claims



1. An extraction tool for use in removing an electronic component from an interconnection medium, comprising:

a body member of substantially rectangular cross section and having a central longitudinal aperture therein,

a pair of side plates immovably affixed to a respective first pair of opposite sides of said body member and extending longitudinally therebeyond, said side plates being adapted to contact said interconnection medium and to straddle said component,

a shaft slidably and rotatably disposed in said aperture of said body member, a coaxial spring member situated in said aperture and enclosing a portion of said shaft,

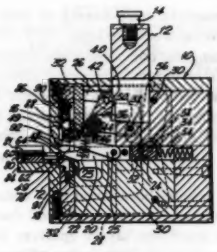
a pair of substantially planar gripper members, means coupling said gripper members to said shaft, said gripper members being disposed adjacent the respective second pair of opposed sides of said body member, said gripper members having respective jaw-like sections at homologous extremities thereof, said jaw-like sections being retracted with respect to opposed edges of said component when said tool is in a rest condition, whereupon the application of an external force to said shaft in the direction of said component is capable of moving said gripper members to an extended preset position and establishing a compressive force in said spring member, means coupled to said shaft for retaining said gripper members in said extended preset position upon the cessation of said external force applied to said shaft, whereby said jaw-like sections are able to engage said opposed edges of said component, and whereupon the subsequent release of the compressive force stored by said spring member acting through said gripper members is capable of applying an extraction force of predetermined magnitude to said component.

4,521,960

APPARATUS FOR TERMINATING FLAT FLEXIBLE CABLES

Werner Maack, Seeheim, and Richard Zendler, Erbach, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 30, 1983, Ser. No. 509,545
Claims priority, application United Kingdom, Jul. 2, 1982, 8219129
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—749 8 Claims



1. Apparatus for inserting the conductors of an end portion of a flat flexible cable into conductor-receiving portions of electrical terminals of an electrical connector, the apparatus comprising a connector supporting anvil, a conductor insertion punch for moving conductors aligned with the terminals laterally of their axes and into the conductor-receiving portions, and first actuator means for driving the punch from a retracted position through a working stroke towards the anvil to insert the conductors of the cable which has been positioned between the punch and a connector supported on the anvil into the conductor-receiving portions, the first actuator means being effective subsequently to drive the punch through a return stroke away from the anvil, the apparatus further comprising a pair of cable notching jaws, second actuator means operatively associated with said first actuator means for moving the jaws along a path of movement between a first position in which

they lie between the punch and the anvil, when the punch is in its retracted position, and a second position in which the jaws are retracted from between the punch and the anvil, third actuator means operatively associated with said first and second actuator means for moving the anvil between a first position in which a connector supported thereon is displaced from the path of movement of the jaws when the jaws are in their first position and a second position in which the connector intersects the path of movement of the jaws when the jaws are in their second position, jaw opening and closing means operatively associated with said first, second and third actuator means for retaining the jaws in an open position when the jaws are in their first position and for closing the jaws about the cable end prior to the movement of the jaws from their first to their second position; the first, second and third actuator means being timed so that subsequently to the insertion of the conductors into the conductor-receiving portions, the jaws are returned from their second to their first position, and the punch is driven through its return stroke to allow the connector to be ejected from between the punch and the anvil.

4,521,961

METHOD FOR THE MANUFACTURE OF A MULTI-POLAR CONTACT STRIP

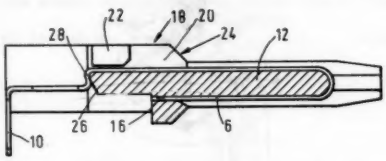
Rolf Roeschlein, Paderborn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,550

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214532

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—884 **5 Claims**



1. Process of producing a multipolar multipoint connector with a plurality of metal contact prongs arranged one beside another, with their first ends bent around the front edge of a carrier, with their second ends projecting out over the rear edge of the carrier, where the first ends of the contact prongs bent backward are accommodated in pockets formed on the bottom side of the carrier, and the parts of the contact prongs situated on the top side of the carrier are accommodated in receptacles formed on the top side of the carrier, and where the second ends projecting over the rear edge of the carrier are bent down as soldering lugs or the like, characterized by the following process steps:

(a) the contact prongs (4) are punched out of a raw material as a strip cohering through webs (2), where the prongs remain joined together by webs (2) situated in the region projecting over the rear edge (26) of the carrier (12);

(b) the first ends (6) are bent back in common;

(c) the contact prongs (4) are jointly slipped onto the carrier (12), where their bent-back first ends (6) engage in assigned pockets (16), and the parts of the contact prongs (4) situated on the top side of the carrier (12) grip by their laterally projecting lugs (8) under assigned projections (22);

(d) the ends (10) projecting over the rear edge (26) are bent at a right angle around the rear edge (26) somewhat in the shape of stairs;

(e) the webs (2) are punched out and the second ends (10) are bent down.

4,521,962

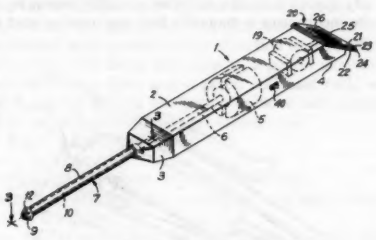
GROOMING DEVICE

Harold Van Natta, 339 Canna Dr., Valdosta, Ga. 31601

Filed Feb. 27, 1984, Ser. No. 584,004

Int. Cl.³ B26B *19/20, 19/26*

U.S. Cl. 30—34.1 **19 Claims**



1. A grooming device for use in cutting hair growing at diverse locations of the human head outside the scalp area, comprising:

a housing;

means for cutting hair located in and adjacent various channels of the human head, including a protective element and a cutting element mounted in said protective element for rotation about an axis;

means for mounting said cutting means on said housing for movement in unison between a retracted position in which said cutting means is at least predominantly situated within the outline of said housing, and an extended position in which said cutting means extends to a considerable extent beyond the outline of said housing;

means for driving said cutting element in rotation relative to said protective element about said axis at least in said extended position of said cutting means;

means for trimming hair, mounted at a location of said housing that is remote from the location of said cutting means, said trimming means including two trimming blades mounted on said location for movement relative to one another, at least that of said trimming blades that is more remote from said housing having a recess therein;

means for driving said trimming means, including an electric clipper; and

at least one distancing element mounted on said housing for movement between a retracted position in which it is accommodated in said recess of said remote cutting blade, and at least one extended position in which it is spaced a predetermined distance from said remote trimming blade.

4,521,963

HYDRAULIC CABLE AND ROD CUTTING AND CRIMPING DEVICE

Michael A. Lind, Salt Lake City, and Michael R. Dunn, Sandy, both of Utah, assignors to New Draulics, Inc., Salt Lake City, Utah

Filed Sep. 28, 1982, Ser. No. 426,014

Int. Cl.³ B23D *21/10*

U.S. Cl. 30—92 **1 Claim**

1. A mechanism for cutting and the like comprising:

two way cylinder assembly means comprising interior piston means carrying piston rod means comprising an exposed portion of variable length;

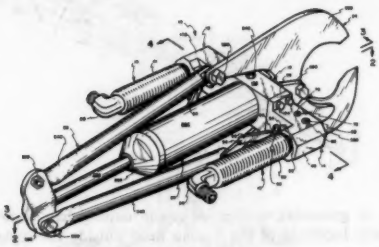
valve means by which influent and effluent fluid is selectively delivered to and removed from the cylinder assembly means;

opposed jaw means disposed forward of the cylinder assembly means, for cutting and the like movable between open and closed positions comprising means operatively responsive to displacement of the piston rod means to dis-

place the jaw means between said open and closed positions;

actuating means associated with the valve means by which the flow path influent and effluent fluid is selectively controlled;

spaced first and second spaced handle means, each handle means at least partially co-extensive with although laterally spaced from the cylinder assembly means by which the mechanism is manually held and manipulated during use;



the actuating means comprising two trigger means, one located adjacent each handle means, both of which must be actuated for the valve means to cause the opposed jaw means to close;

the valve means comprising flow control spool means and the two trigger means each comprising means controlling the location of the spool means and a trigger by which said controlling means are manipulated.

4,521,964

TOOL FOR MEALS WITH THE FUNCTION OF SCISSORS

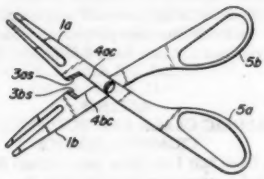
Takashi Maruyama, 12-9, Kitakarasuyama 9-chome, Setagaya-ku, Tokyo 157, Japan

Filed Apr. 18, 1983, Ser. No. 486,229

Claims priority, application Japan, Apr. 23, 1982, 57-58413[U]; Feb. 14, 1983, 58-19014[U]; Mar. 7, 1983, 58-31650[U]

Int. Cl.³ B26B *13/00*

U.S. Cl. 30—148 **1 Claim**



1. A tool for meals with the function of scissors, fork and crusher, comprising two blade bodies, each blade body being composed of:

(a) a tip portion, said tip portion having a sharp edge adapted to coact as a scissor portion, said tip portion having a fork set diverging and separating from a back portion of said sharp edge and in parallel with said back portion, said back portion being similar to a tip portion of the usual fork for meals by overlapping the sharp edges of said two blade bodies;

(b) a central portion, said central portion being pivotably connected by a pin to a central portion of the other blade body;

(c) a handle portion extending from said central portion;

(d) said central portion having a planar surface, said tip portion having a curvilinear plane curving in a predetermined direction from said planar surface, said handle portion having a curvilinear plane curving in an opposite direction with respect to said planar surface;

(e) said fork set having a shoulder integrally formed with said central portion, said shoulder and a portion of said central portion defining a dull edge, both of said shoulders and both of said portions of said central portion defining a crushing enclosure, whereby, when the handle portions are actuated to position the sharp edges opposing each other, a scissor action is obtained, and when the handle portions are pivoted over each other, the dull edges are positioned opposite each other, crushing action is obtained.

4,521,965

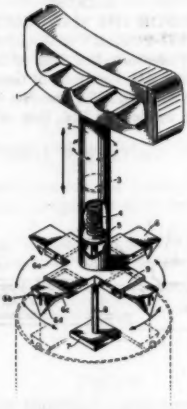
HAND-DRIVEN, RECIPROCATING CAN OPENER

Leroy Walker, 4719 Rhodes Dr., New Orleans, La. 70126

Filed Jul. 7, 1983, Ser. No. 511,536

Int. Cl.³ B67B *7/34*

U.S. Cl. 30—410 **14 Claims**



1. A can opener for cutting open the tops of cylindrical metal cans, comprising:

a vertically disposed, main shaft;

handle means connected to the upper portion of said shaft for grasping in the user's hand and moving the shaft vertically up-and-down and rotating it about a vertical axis;

a multiple number of radially extending arms connected to and extending out laterally away from the lower portion of said shaft;

cutting blade means located at the ends of said radial arms for cutting the can top as said main shaft is reciprocated and turned; and

inverted "U" shaped hook means located at the distal ends of said radial arms for engaging and holding the upwardly extending peripheral circular lip of the can during the can opening process.

4,521,966

METHOD AND APPARATUS FOR DETERMINING THE POSITION OF THE CENTER OF A CIRCULAR OBJECT

Thomas Karlsson, Lidkoping, Sweden, assignor to Lidkopings Mekaniska Verkstads AB, Lidkoping, Sweden

Filed Aug. 30, 1983, Ser. No. 527,799

Claims priority, application Sweden, Sep. 14, 1982, 8205233

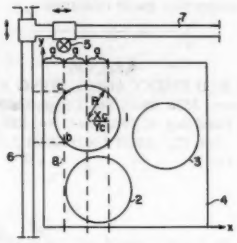
Int. Cl.³ G01B *7/28*

U.S. Cl. 33—1 M **6 Claims**

1. Method of determining the position of the center of a

circular object with a known diameter on a generally flat surface comprising the steps of:

sequentially moving a sensor along a plurality of know paths proximate said surface, each said path comprising a line portion, with the greatest distance between two adjacent line portions being less than the radius of said circular object;



measuring the position of the sensor at two points in the same line portion where said sensor passes over the circumference of said object between said sensor and said surfaces; and

calculating the position of the center of said object using the measured positions of the sensor at said two points.

4,521,967

HEIGHT GAUGE

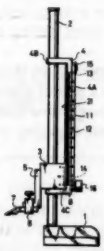
Kenju Uchino, Utsunomiya, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 487,939

Claims priority, application Japan, May 8, 1982, 57-77248

Int. Cl.³ G01B *3/20, 5/02*

U.S. Cl. 33—169 R **8 Claims**



1. A height gauge, comprising:

a base;

an elongated support erected on said base;

a main slider slidably mounted on said support in the lengthwise direction thereof;

means for releasably securing said main slider to said support;

a main graduated scale formed on said main slider in the direction of movement of said main slider along said support, said scale being free of numerical indications designating distances between graduations of said main scale;

a measuring slider slidably supported on said support in the lengthwise direction thereof, said measuring slider being adjacent to one side of said main slider and having vernier graduations thereon readable in conjunction with said main scale;

a pair of upper and lower pulleys mounted near opposite ends of said main slider on the opposite side thereof from said measuring slider;

a flexible endless belt resiliently tensioned around said pulleys for movement therewith, said belt having numerical value indications formed thereon at regular intervals which correspond to graduations of said main scale, said belt being positioned parallel and adjacent to said main scale, on the opposite side thereof from said measuring slider to allow numerical readings of said main scale to be made using said belt; and

means for adjustably securing said measuring slider to said main slider, including a toothed rack formed on said main graduated scale parallel to the direction of movement of said main scale along said support, a pinion mounted on said measuring slider and engaged with said rack, and a hand grip for driving said pinion to move said measuring slider relative to said main graduated scale.

7. A height gauge, comprising:

a base;

a first elongated support erected on said base;

a second elongated support erected on said base parallel to said first support;

means rigidly connecting the ends of said first and second supports remote from said base;

a graduated scale formed on said second support in the lengthwise direction thereof, said scale being free of numerical indications designating distances between graduations of said scale, and said scale being movable in the lengthwise direction of said second support over a predetermined distance range;

a measuring slider slidably supported on said first support in the lengthwise direction thereof;

a flexible endless belt mounted on said second support for movement in the lengthwise direction of said graduated scale, said belt having numerical value indications formed thereon at regular intervals which correspond to graduations of said main scale, said belt being positioned to allow numerical readings of said main scale to be made using said belt; and

means for adjustably securing said measuring slider to said first support.

4,521,968

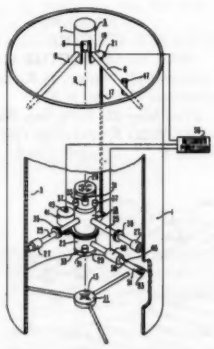
MAPPING SYSTEM FOR AN INTERNAL CYLINDRICAL SURFACE

Larry C. Wiltermood, Port Orchard, Wash.; David J. Barich, and Fred G. Siedow, both of San Jose, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1982, Ser. No. 434,098

Int. Cl.³ G01B *7/12, 7/28*

U.S. Cl. 33—178 E **3 Claims**



1. A system for mapping an internal cylindrical surface comprising:

a first spider disposed adjacent one end of said cylindrical surface;

a second spider disposed adjacent the other end of said cylindrical surface;

a third spider disposed within said cylindrical surface intermediate said ends;

said first spider having a laser disposed therein which projects a beam of light generally normal thereto and from its center;

said second spider having a target centrally disposed thereon and so disposed within the cylindrical surface that when said beam of light strikes the center of said target said beam of light is generally aligned with the axis of said cylindrical surface;

means for positioning said third spider within said cylinder and producing a signal indicative of the depth therein of said third spider relative to said one end of said cylinder;

means for affixing said third spider at any depth relative to said one end of said cylinder;

said third spider having a centrally disposed opening extending therethrough, a first target disposed at one end of said opening and a second target disposed at the other end of said opening;

means for moving said first and second targets from the axis of said opening in said third spider to a position where said opening will pass said beam of light unobstructed therethrough;

an arm rotatably disposed on said third spider to rotate about the axis of said opening in said third spider;

means for adjusting the azimuth and X-Y position of said central opening within said third spider after said third spider has been affixed at one position within said cylinder so that said axis of said central opening can be aligned with said axis of said cylindrical surface utilizing said beam of light and said first and second targets disposed at the ends of said opening;

means for determining a set angular position of said rotatable arm with respect to a fixed point on said cylindrical surface;

means for rotating said arm and producing a signal of said arms angular position with respect to said set angular position;

said arm having a predetermined length, having a movable end which is biased outwardly and having means for producing a signal indicative of the distance between the axis of said arm and the distal end of said movable end thereof; and

means for recording signals indicative of the depth of said third spider with respect to said one end of the cylindrical surface, said angular position of said arm with respect to said set angular position and the distance between the axis of said rotatable arm and said distal end thereof.

4,521,969

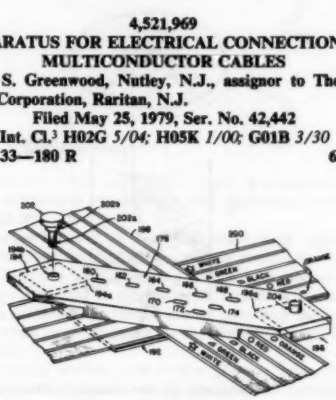
APPARATUS FOR ELECTRICAL CONNECTION OF MULTICONDUCTOR CABLES

William S. Greenwood, Nutley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed May 25, 1979, Ser. No. 42,442

Int. Cl.³ H02G *5/04*; H05K *1/00*; G01B *3/30*

U.S. Cl. 33—180 R **6 Claims**



1. Apparatus for use in the connection of flat multiconductor cables disposed in mutually overlapping relation and defining a matrix of connection zones wherein each zone has a unique pair of cable conductors in registry therewith, said apparatus comprising: a connection guide defining openings therethrough in registry with less than all of said connection zones; and selector means variably positionable with respect to said connection guide for rendering accessible for use only selective of said connection guide openings.

4,521,970

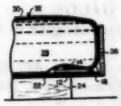
WATER BED SHEET ANCHORING APPARATUS

James M. Jester, 3530 Atoll, San Diego, Calif. 92111

Filed Sep. 6, 1983, Ser. No. 529,410

Int. Cl.³ A44B *1/42*; G01B *3/00*

U.S. Cl. 33—180 R **17 Claims**



1. A sheet holder for a water bed, comprising:

a generally thin flat panel having a top surface and a bottom surface;

an anchoring slot opening to the top and toward one end thereof defined by a pair of spaced apart rails wherein said slot and rails project above the top surface of said panel for overlapping and engaging the edges of a button.

4,521,971

MEASURING HEAD FOR SCREW THREAD MEASURING MACHINES

Manfred Mayer, Oberndorf, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,125

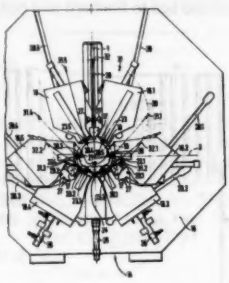
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222583

Int. Cl.³ G01B *5/16*

U.S. Cl. 33—199 B **9 Claims**

1. A measuring head for screw thread measuring machines capable of measuring threads of a piece to be measured which has an outer diameter with a measuring point and which may be of any size within a predetermined limit, comprising a base plate having a thruhole and a plurality of straight support grooves extending thereover, clamping and measuring elements displaceably received in said support grooves, said plate having a vertical cross-sectional axis of its thruhole which coincides with the vertical axis of the outer diameter of the measured piece clamping and measuring elements being uniformly distributed around the outside diameter of said measured piece, and being displaceable in an associated support groove from an outer position into an inner position to contact the measured piece at a measuring point, said support grooves extending parallel to a straight line connecting a measured

point at the outer diameter of the measured piece with a point at which the vertical cross-sectional axis of the outer diameter



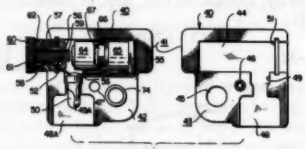
of the measured piece and the lower circular arc of the measured piece intersect.

4,521,972

ILLUMINATED SIGHTING STRUCTURE FOR ARCHERY BOWS

Marlow W. Larson, 2735 S. 4050 West, Ogden, Utah 84401

Filed Apr. 28, 1983, Ser. No. 489,499
Int. Cl.³ F41G 1/34, 1/46
U.S. Cl. 33—265 **9 Claims**



1. An illuminator unit for illuminating the sight tips of archery bows, said unit including, in combination: housing structure provided with a light aperture; a light mounted proximate and illuminating through said light aperture; an electrical circuit, including battery means, disposed in said housing structure and coupled to said light for selectively energizing the same, said electrical circuit including non-conductive resilient spacer means, compressible along its elemental width to complete said circuit, interposed in said electrical circuit; and actuatable means threadedly engaging said housing structure for selectively compressing said resilient spacer means whereby to electrically complete said circuit.

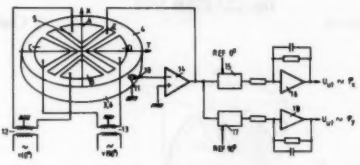
8. In combination: an archery bow having a bracket provided with a series of sights; an illuminator unit mounted to said bracket and housing light means for illuminating said sights, said illuminator unit having a non-conductive housing means provided with electrical circuit means, having a non-conductive circuit interruptor, coupled to said light means, and screw means threaded through said housing means for selectively compressing and then releasing the compression as to said interruptor arranged to complete said circuit means when compressed, for thereby completing and also for interrupting said circuit means.

4,521,973

ELECTRONIC LEVELLING CELL

Klas R. Wiklund, and Lars A. Ericsson, both of Täby, Sweden, assignors to Getronics AB, Danderyd, Sweden

PCT No. PCT/SE82/00311, § 371 Date May 11, 1983, § 102(e) Date May 11, 1983, PCT Pub. No. WO83/01304, PCT Pub. Date Apr. 14, 1983
PCT Filed Oct. 1, 1982, Ser. No. 495,349
Claims priority, application Sweden, Oct. 2, 1981, 8105840
Int. Cl.³ G01C 9/06, 9/20
U.S. Cl. 33—366 **14 Claims**



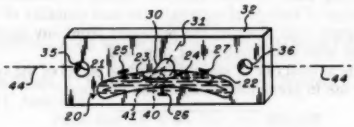
1. A device for detecting deviation of a plane from level position, including a conductive gravity-levelled reference element defining a horizontal reference surface, at least one pair of conductive, rigidly mounted sensing electrode members jointly defining said plane and disposed adjacent the reference surface in confronting relation therewith, a dielectric fluid separating the reference surface from the sensing electrode members, the reference element, the pair of sensing electrode members and the dielectric fluid forming a pair of capacitors the capacitances of which vary oppositely in response to deviation of said plane from parallelism of the reference surface and a line joining the pair of electrode members, and means for detecting variations of the capacitances of the pair of capacitors, characterized in that the detecting means includes an alternating current source connected to the pair of capacitors and for applying oppositely phased first and second alternating voltages to respective ones of the capacitors, the product of the capacitance and the applied voltage being equal for both capacitors when the reference surface and said line are parallel, and an inverting amplifier including a feed-back capacitor and having its input connected to the gravity-levelled element.

4,521,974

TEMPERATURE STABLE ARCUATE BUBBLE GRAVITY SENSOR MOUNT

Thomas W. Neis, Phoenix, and Harold L. Swartz, Glendale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,910
Int. Cl.³ G01C 9/24
U.S. Cl. 33—379 **7 Claims**



1. A temperature stable bubble gravity sensor comprising:
an electrolytic bubble gravity sensor having an arcuate shaped enclosure disposed in a plane passing through a central arc,
first mounting means, having a longitudinal axis and a first and second end, for mounting said sensor, said first end being bonded to said sensor so that said longitudinal axis is substantially orthogonal to said plane in which said central arc is disposed, whereby measuring errors arising from ambient temperature variations are reduced;
means for bonding said first end to said sensor; and

second mounting means, fixed to said second end of said first mounting means, for mounting said first mounting means and sensor.

4,521,975

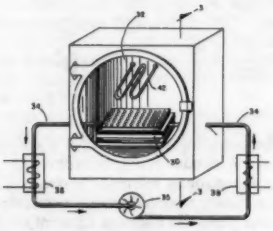
LYOPHILIZING AND FORMING BIOLOGICALS HAVING A PREDETERMINED UNIT DOSAGE

Donald L. Bailey, Thornton, Colo., assignor to Marquest Medical Products, Inc., Englewood, Colo.

Division of Ser. No. 260,179, May 4, 1981, abandoned. This application Jul. 30, 1982, Ser. No. 403,309

Int. Cl.³ F26B 5/06

U.S. Cl. 34—5 **7 Claims**



1. A process involving lyophilization of biological material for producing pledgets of biological material in predetermined unit dosages for providing at least one of said pledgets in a syringe, comprising the steps of:

providing a predetermined amount of liquid;

providing a predetermined amount of biological material;

providing a container including a top portion and having a plurality of wells formed in said container, each of said wells defining a volume for receiving a desired amount of biological material solution;

forming a desired solution of biological material to produce pledgets of predetermined unit dosages using the magnitude of the predetermined amount of the liquid, the volume of each of said wells, and the predetermined magnitude of the amount of biological material;

placing said biological material solution in said wells of said container;

positioning said container in a chamber;

lyophilizing said biological material solution in said wells using said chamber to produce pledgets, each of said pledgets having a predetermined dosage of biological material;

removing each container from said lyophilizing chamber;

exposing said pledgets of said biological material in said wells wherein said pledgets can be removed;

removing each of said pledgets having a predetermined dosage of biological material from said plurality of wells, wherein said pledgets are separated from any apparatus used with said lyophilizing step; and

placing at least one of said pledgets in a barrel of the syringe for use in preventing coagulation of blood.

4,521,976

METHOD OF OPERATING A FLUIDIZED BED HEAT EXCHANGER UTILIZING INDUCED CIRCULATION

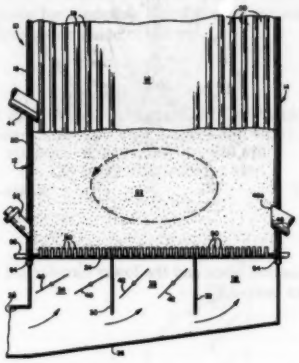
Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 322,310, Nov. 17, 1981, Pat. No. 4,446,629. This application Nov. 25, 1983, Ser. No. 555,119

Int. Cl.³ F26B 3/08

U.S. Cl. 34—10 **1 Claim**

1. A method of operating a fluidized bed heat exchanger comprising the steps of supporting a bed of particulate material on a perforated grate, introducing additional particulate material to a first portion of said bed, discharging spent bed material from a second portion of said bed, and introducing air, via nozzles associated with the perforations in said grate, into both of said portions of said bed to fluidized said bed, the number of



perforations formed through said plate, and the number of nozzles, increasing in a direction across said plate from said first bed portion to said second bed portion to vary the flow rate of air introduced into said first bed portion from the flow rate of air introduced into said second bed portion.

4,521,977

METHOD AND AN APPARATUS FOR EXTRACTING GASES AND VAPORS FROM A DRYING HOPPER FILLED WITH BULK MATERIAL

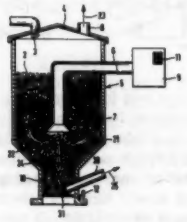
Roderich W. Gräff, Kollwitzweg 19, 6100 Darmstadt-Arheilgen, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,532

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234431

Int. Cl.³ F26B 3/06

U.S. Cl. 34—32 **11 Claims**



1. A method of drying a bulk of plastic granules, comprising the step of providing a hopper including an upper part and a bottom part; feeding the granules through a feeding opening for the granules in the upper part of the hopper; withdrawing the granules through an outlet port for the granules at the bottom part of the hopper; supplying air into the hopper through an air inlet pipe; distributing the air in the hopper by an air distributor into which the air inlet pipe opens and which extends into the interior of the hopper into the bulk of granules above the outlet port; discharging a portion of the air through a first air outlet pipe situated in the upper part of the hopper; and discharging a remaining portion of the air through a second air outlet pipe fixed in the hopper near the outlet port such that said remaining portion of the air is caused to follow a path from the air distributor through the granules in the space

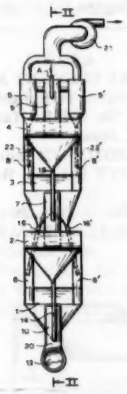
between the air distributor and the outlet port to cause complete drying of the granules in the bottom part of the hopper.

4,521,978

HEAT EXCHANGER FOR THERMALLY TREATING A PULVERULENT MATERIAL

Gérard Ghestem, Santes, France, assignor to Fives-Cail Babcock, Paris, France

Filed Dec. 7, 1983, Ser. No. 558,938
Claims priority, application France, Dec. 14, 1982, 82 20909
Int. Cl.³ F26B *17/14*
U.S. Cl. 34—57 R **5 Claims**



1. A heat exchange apparatus for thermally treating a pulverulent material by a countercurrent flow of a gas, which comprises

(a) a source of the gas,

(b) a series of alternating types of at least two superposed separators, each one of the separators having a cylindrical body with a horizontal axis, one of the separator types having an inlet at a mid-point of the cylindrical body and two outlets at respective ends thereof, and the other separator type having an outlet at a mid-point of the cylindrical body and two inlets at respective ends thereof,

(c) gas duct means connecting the superposed separators to the source of gas so that the gas flows from the source of gas in series to successive ones of the separators, the gas duct means comprising

(1) a first gas duct leading tangentially with respect to the cylindrical body to the inlet of each one of the separators having the inlet at the mid-point thereof, and

(2) second gas ducts leading tangentially with respect to the cylindrical bodies from the outlets of each one of the separators having two outlets to the inlets of a succeeding one of the separators having two inlets at the respective ends,

(d) means for feeding the pulverulent material to be treated into the gas duct means remote from the gas source whereby the pulverulent material passes into each one of the separators suspended in the gas current and is separated therefrom in the separators, and

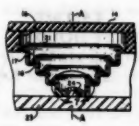
(e) conduit means connecting the separators for delivering the separated pulverulent material from a respective one of the separators to a separator preceding the same in the direction of the gas flow.

4,521,979

SHOCK ABSORBING SHOE SOLE

Anton J. Blaser, 700 E. Mason St., Santa Barbara, Calif. 93101

Filed Mar. 1, 1984, Ser. No. 585,271
Int. Cl.³ A43B *13/20*
U.S. Cl. 36—29 **7 Claims**



1. A shock absorbing shoe sole including, in combination:

(a) a supporting pad having a plurality of circular recesses on its underside; and

(b) a like plurality of identical individual enclosures covering said recesses, each enclosure comprising a series of annular walls successively axially spaced from the recess associated with the enclosure and having successively decreasing diameters, the walls being in partially nested relationship, the extending end of each wall connecting to the beginning end of the next successive smaller diameter wall so that an accordion pattern results, the enclosure defining an air chamber, the connecting portions of the walls having air escape openings, the end of the smallest diameter wall having an air slot functioning as a valve whereby when a person walks on the sole, the various air chambers defined by the enclosures are repeatedly collapsed in telescoping, accordian fashion wholly into their associated recesses, all air being substantially exhausted to avoid any appreciable captured air which could act as heat retaining thermal air pockets, and expanded when pressure is relieved with each step, so that the sole breathes and keeps the wearer's foot cool, the same action resulting in a shock absorbing and cushioning action by the sole.

4,521,980

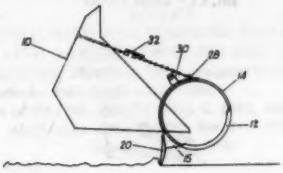
GRADING AND SMOOTHING ATTACHMENT FOR A LOADER BUCKET

Nikola Solaja, 17 Whittle Pl., Osborne Park, Western Australia, 6017, Australia

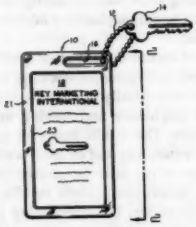
Filed Jun. 19, 1984, Ser. No. 622,232
Claims priority, application Australia, Jun. 21, 1983, PF9919
Int. Cl.³ E02F *3/96*
U.S. Cl. 37—117.5 **7 Claims**

1. An attachment for a loader with a scoop bucket, said attachment positioned to travel ahead of the scoop bucket, wherein the attachment comprises an elongated body member generally in the form of a hollow cylinder, a centrally disposed lateral slot formed within the length of the body member defining opposite ends in the body for mating engagement with the bucket, a blade extending laterally of the elongated body member and projecting outwardly therefrom, and means for securing the attachment to the bucket by mating said bucket in said slot, said blade being disposed relative to the bucket such

that when the bucket is orientated in a first position the blade is arranged to engage with the ground and to grade the ground upon movement of the loader and when the bucket is orientated in a second position the body member is arranged to engage with the ground and to smooth the ground upon movement of the loader.



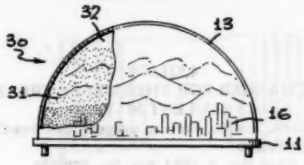
4,521,981
KEY HOLDER
Robert Kasprzycki, Meriden, and Chester Fudge, Rockfall, both of Conn., assignors to International Key Marketing Incorporated, Bristol, Conn.
Filed May 2, 1983, Ser. No. 490,260
Int. Cl.³ A44C *3/00*
U.S. Cl. 40—2 A **2 Claims**



1. Key tags for hotel keys and the like for use with an indicia bearing insert of resilient flexible sheet material, said tag comprising a base panel and an apertured frame portion with a slot through at least one edge portion of the frame for receiving said insert therethrough, said tag including a retaining surface for engaging the insert to retain the same within said frame, said base panel being of stepped construction having a lower level disposed adjacent said slot and an upper level adjacent the opposite edge of said tag, said slot opening through said frame at about the same height as the lower level of the stepped base panel whereby the resilient insert is tensioned as it is being inserted through said slot and its leading edge portion extends over the upper level of said base, the tension being released when said insert is fully inserted into said frame so that it will flex into engagement with said retaining surface.

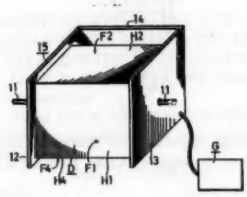
4,521,982
NOVELTY VIEWER
Nicholas Altuchow, P.O. Box 1387, Reseda, Calif. 91335
Filed May 7, 1984, Ser. No. 607,674
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—407 **1 Claim**

1. A novelty viewer comprising:
an elongated base having rounded ends;
an enclosure carried on said base having a fluid content;
a sheet disposed against a portion of the inner surface of said enclosure;
an animated structure of a city disposed on said base within said enclosure and immersed in said fluid;
said fluid adapted to visually appear in at least three layers within said enclosure having the lowermost layer denser in color than the upper layers;
said sheet carries graphic indicia or illustrations characterized as a background for said animated city structure;



a plurality of particles of different size and weight suspended in said fluid;
selected particles of similar size and weight constituting and defining said three layers with particles of greatest density and weight defining the lowermost level.

4,521,983
ROTATING DISPLAY ELEMENT AND DISPLAY UNIT USING THE SAME
Yoshimasa Wakatake, No. 405, 9-5 Tamagawa 1-chome, Setagaya-ku, Tokyo 158, Japan
PCT No. PCT/JP83/00332, § 371 Date Jun. 7, 1984, § 102(e) Date Jun. 7, 1984, PCT Pub. No. WO84/01653, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 7, 1983, Ser. No. 619,160
Int. Cl.³ G09F *11/02*
U.S. Cl. 40—473 **4 Claims**



1. A rotating display element, characterized by the provision of a display surface member having a plurality of display surfaces, and a permanent magnet type motor mechanism;
wherein the display surface member is mounted on the rotor of the permanent magnet type motor mechanism so that it incorporates therein the permanent magnet type motor mechanism;
wherein the plurality of display surfaces of the display surface member are arranged side by side around the axis of the rotor;
wherein either one of the rotor and stator of the permanet magnet type motor mechanism has first and second double-pole permanent magnet members respectively having north and south magnetic poles and disposed side by side in the direction of extension of the axis of the rotor;
wherein the north and south magnetic poles of the first double-pole permanent magnet member are disposed around the axis of the rotor at an angular distance of 180° from each other;
wherein the north and south magnetic poles of the second double-pole permanent magnet member are disposed around the axis of the rotor at an angular distance of $\pm\alpha°$ (where $\alpha°$ has a value represented by $0° \leqq \alpha° < 180°$) from the north and south magnetic poles of the first double-pole permanent magnet member and at an angular distance of 180° from each other;
wherein the other of the rotor and the stator of the permanent magnet type motor has a first magnetic member

provided with first and second magnetic poles acting on the north and south magnetic poles of the first double-pole permanent magnet member, a second magnetic member provided with third and fourth magnetic poles acting on the north and south magnetic poles of the second double-pole permanent magnet member, a first exciting winding wound on the first magnetic member in manner to excite the first and second magnetic poles in reverse polarities, and a second exciting winding wound on the second magnetic member in a manner to excite the third and fourth magnetic poles in reverse polarities;

wherein the first and second magnetic poles of the first magnetic member are disposed around the axis of the rotor at an angular distance of 180°; and

wherein the third and fourth magnetic poles of the second magnetic member are disposed around the axis of the rotor at an angular distance of $\pm 90° \pm \alpha°$ from the first and second magnetic poles of the first magnetic member and at an angular distance of 180° from each other.

4,521,984

MENU BOARD FRAME AND INSERT

Ledell L. Murray, Noblesville, Ind., assignor to General Indicator Corporation, Pardeeville, Wis.

Continuation of Ser. No. 433,836, Oct. 12, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 553,142

Int. Cl.³ G09F *13/04*

U.S. Cl. 40—576 **4 Claims**

1. A sign assembly comprising,

a frame having horizontal and vertical members,

each member having a "Z-shaped" cross section with parallel front and back portions interconnected by a leg normal to each portion, the back portion extending from the leg towards the outside of the frame and the front portion extending from the leg towards the inside of the frame,

a plurality of parallel, spaced apart extruded rails extending between the vertical frame members,

each rail having front, rear, top and bottom surfaces of equal length,

opposed slots in the top and bottom surfaces adjacent the front surface and the rear surface of the rail so the front and rear of the rail are connected to the main body of the rail by front and rear webs respectively,

each end of the rear web of each rail being received and retained in a slot in the inner edge of the front portion of the vertical frame members,

the vertical frame members being dimensioned so the slots adjacent the front of the rails are positioned in front of the frame members to allow items to be received in the ends of the slots.

4,521,985

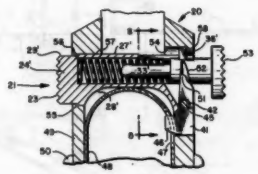
AMBIDEXTROUS GUN MAGAZINE RELEASE

Alan K. Smith, 211 Betty Dr., and Stephen R. Alexander, 814 Scottsdale Dr., both of Richardson, Tex. 75080

Filed May 16, 1983, Ser. No. 494,864

Int. Cl.³ F41C *25/06*

U.S. Cl. 42—7 **23 Claims**



1. A magazine release for a semi automatic gun including: a magazine catch lock release structure with, a catch body having a longitudinally extended opening, a catch lock release member having a body slidably received in said longitudinally extended opening of said magazine catch body, resiliently compressable spring means held in said longitudinally extended opening resiliently compressed between said magazine catch body and said catch lock release member when said magazine catch lock release structure is inserted in and restrained in place in a gun receiver and a magazine cam surfaced catch locking lever pivotally mounted on said magazine catch body; said catch locking lever including tip means engaging said catch lock release member for movement of the lever tip means with longitudinal movement of said catch lock release member relative to said magazine catch body; said catch locking lever also having a lock paw moveable into and out of a catch slot provided in a magazine with pivot movement of said locking lever; a cam surface of said locking lever rides over a surface of a magazine being inserted into the gun receiver until the magazine catch slot comes into locking alignment with said lock paw that is then snapped into locking engagement in the magazine catch slot as urged by said spring moving said catch lock release member and pivoting the lever for such cam lock action; and with said catch lock release member manually moveable inward against the resilient force of said spring to pivot said lever for catch lock release of the lever lock paw from said catch slot for magazine release.

4,521,986

NET FABRIC FOR TRAWLING

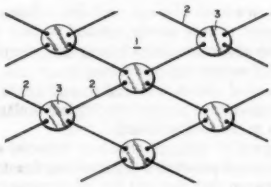
Tatsumi Koga, 40 Victoria Heights, Nelson, New Zealand

Filed Jul. 24, 1984, Ser. No. 633,895

Claims priority, application Japan, Sep. 19, 1983, 58-172841

Int. Cl.³ A01K *73/02*

U.S. Cl. 43—9 **9 Claims**



1. A net fabric for a trawling net, comprising:

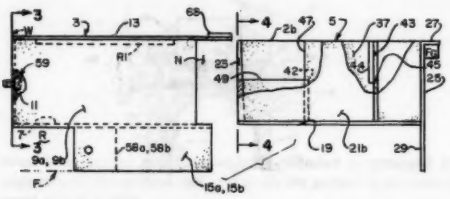
metallic net legs forming meshes, and plates for connecting said net legs at their intersections, said plates resisting the flow of water through the net.

4,521,987

BAIT STATION AND TRAP

Charles E. Knote, 2323 Brookwood Dr., Cape Girardeau, Mo. 63701

Filed Oct. 11, 1983, Ser. No. 540,407
Int. Cl.³ A01M *1/20*
U.S. Cl. 43—131 **11 Claims**



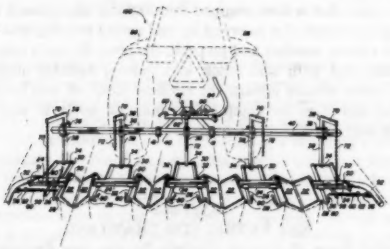
1. A bait station or trap comprising an open front housing and a tray insertable into said housing in the open front of the housing, said housing having means for supporting it above the surface on which it rests, said tray having a floor and partition means thereon defining an entrance chamber, a bait chamber, and a circuitous path between said entrance chamber and said bait chamber, said tray floor having an access opening therethrough in register with said entrance chamber wherein a pest must enter said bait station from below said tray floor and must travel said circuitous path from said entrance chamber to said bait chamber.

4,521,988

SELF ALIGNING CROP SPRAYING APPARATUS

Gary W. Thacker, 4450 W. 8th St., Yuma, Ariz. 85364

Continuation-in-part of Ser. No. 347,892, Feb. 11, 1982, abandoned. This application Sep. 27, 1982, Ser. No. 424,528
Int. Cl.³ A01C *23/02*
U.S. Cl. 47—1.7 **16 Claims**



1. Self aligning sled apparatus for spraying a chemical mixture to the ground surface proximate plant stems in a crop row comprising:

at least one sled adapted to be towed by a prime mover between two rows of crops, said sled defining a U-shaped bar adapted to ride on the ground surface between the crop rows and to be guided by engaging the plant stems in the crop rows on opposite sides;

a pair of angled shields attached to said U-shaped bar and adapted to engage a crop row's plant foilage and lift it upwards as the sled is towed;

a pair of parallel linkages attached between said sled U-shaped bar and prime mover permitting freedom of movement between said sled and the prime mover;

a modified sled adapted to be towed adjacent said sled having said U-shaped bar, said modified sled including a L-shaped bar adapted to ride on the ground surface proximate a crop row;

an angled shield attached to said L-shaped bar adapted to engage the crop row plant foilage and to raise the foilage as the sled is towed;

a spring loaded arm pivotally connected to said L-shaped bar, said spring loaded arm arcuate shaped and adapted to engage the stems of the crop row plants in an adjacent crop row where by such engagement, said L-shaped arm is urged against the stems of the plants in the crop row between the adjacent sled having the U-shaped bar, and

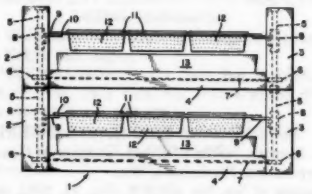
spraying apparatus attached to said angled shields of said U-shaped bar and said L-shaped bar, said spraying apparatus including spray nozzles oriented towards the ground proximate the crop row plant stems.

4,521,989

SPROUTING APPARATUS

Bruno Meyer, Lindenstrasse 2, D-5238 Hachenburg, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,719
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242037
Int. Cl.³ A01G *31/02*
U.S. Cl. 47—14 **18 Claims**



1. An apparatus for the generation of sprouts from materials capable of sprouting comprising

a side frame;

a dish disposed closely spaced relative to the side frame for holding a feed liquid for the materials capable of sprouting;

a support provision attached to the side frame for supporting the side frame and the dish;

a support means;

a spindle disposed vertically;

a drive motor connected to the spindle;

a lift nut attached to the support means and secured to the spindle and secured against rotation, whereby the motor rotates the spindle and provides vertical displacement of the lift nut;

a support plate having an open area and supported by the support means;

a sprouting container provided as a sieve, placed into the open area of the support plate, and adapted to dip into the dish when the movable part of the lift drive is in a corresponding position.

4,521,990

RETAINER FOR ATTACHING FLORAL LID CONTAINER

John F. Murray, Pacific Palisades, Calif., assignor to Teleflora, Inc., Los Angeles, Calif.

Continuation of Ser. No. 546,960, Oct. 31, 1983, abandoned. This application Apr. 19, 1984, Ser. No. 601,734
Int. Cl.³ A01G *5/00*
U.S. Cl. 47—41.12 **17 Claims**

1. In combination,

a container for holding a bouquet of flowers with the flower stalks projecting through an opening in the container;

a lid removably mountable on said container to close said opening when said container is not in use for holding the flowers;

a crossbar releasably engageable with said lid;

a body of stalk supporting material removably positioned within said container for receiving and supporting the ends of the flower stalks with the flowers positioned outside said container; and

a shaft fixedly connected at one end to said crossbar extending generally perpendicularly therefrom, said shaft having

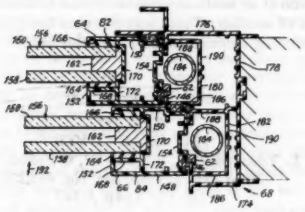
its opposite end received within and supported by said body of stalk supporting material, said shaft being of sufficient length to pass through said opening with its one end supporting said crossbar and said lid outside said container in adjacent relation to said flowers when said container is in use for holding flowers.

4,521,991

WINDOW APPARATUS

Bertram Sayer, Princeton, and Bernard J. Kulkaski, Somerset, both of N.J., assignors to Thermal Profiles, Inc., Plainview, N.Y.

Filed Jan. 26, 1984, Ser. No. 574,276
Int. Cl.³ E05D *15/22*
U.S. Cl. 49—161 **11 Claims**



1. A window apparatus comprising window jamb means, window frame means mounted on said jamb means and capable of sliding relative to said jamb means from a closed position to an open position and capable of pivoting with respect to said window jamb means and removable locking member means engaging both said window frame means and said window jamb means to prevent said pivoting of said window frame means, said window jamb means including a lip portion perpendicular to plane of window with said locking member means engaging said lip portion.

4,521,992

RAMP-OPERATED MECHANICAL GATE SYSTEMS

Donald C. Campbell, 3600 Oro St., Redding, Calif. 96001

Filed Oct. 31, 1983, Ser. No. 547,008
Int. Cl.³ E05F *13/00*
U.S. Cl. 49—269 **7 Claims**

1. A ramp-operated mechanical gate system, comprising:

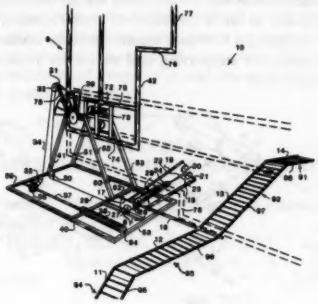
a gate support structure;

a gate structure pivotally attached to said gate support structure;

a collapsible ramp of sufficient size and strength to withstand the weight of a motor vehicle and offset from said gate support structure;

a first rod rigidly attached to and extending substantially perpendicularly from said collapsible ramp toward said gate support structure which turns when said collapsible ramp is depressed;

a lever arm attached to and extending substantially perpendicularly from said rod, and



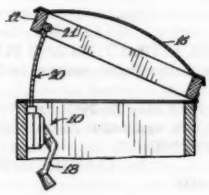
power transfer means connected between said lever arm and said gate structure such that said gate structure opens when said collapsible ramp is depressed, and having at least one spring.

4,521,993

CHAIN OPERATOR FOR A WINDOW

John C. Tacheny, Owatonna, and Anthony C. Schema, Faribault, both of Minn., assignors to Truth Incorporated, Owatonna, Minn.

Filed Aug. 8, 1983, Ser. No. 521,043
Int. Cl.³ E05F *11/00*
U.S. Cl. 49—325 **20 Claims**



1. A chain operator for a window comprising, a casing having a chain storage area including a chain guide track having a curved portion extending to a chain exit from the casing, a drive sprocket in said casing engageable with said chain, drive means connected to said sprocket for converting a power input into rotation of said drive sprocket and a unitary liner fitted in said casing and having a first part for rotatably mounting the drive sprocket and a second part lining the curved portion of the guide track opposite said drive sprocket.

4,521,994

POLISHER-FINER APPARATUS

Joseph Tusinski, Muskogee, Okla., assignor to Coburn Optical Industries, Muskogee, Okla.

Filed Jul. 20, 1983, Ser. No. 515,409
Int. Cl.³ B24B *7/00*
U.S. Cl. 51—58 **16 Claims**

1. An apparatus for finishing a surface of a lens comprising;

a frame;

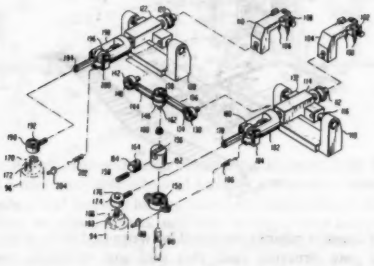
means connected to said frame for providing an orbital, break-up motion to a tool having a polishing surface of a selected base curve and cross curve; and

means connected to said frame for providing a smooth, continuous Lissajous figure motion to a lens of generally

common base curve and cross curve with the tool, said means including,

means connected to said frame for mechanically supporting the lens for reciprocation in an X direction and simultaneous reciprocation in an Y direction;

means connected to said frame for driving said supporting means in an X direction of reciprocation, said means including a first cam means operably connected to said means for supporting and means for rotating said first cam; and



means connected to said frame for driving said means for supporting in a Y direction of reciprocation, said means including a second cam means and means for rotating said second cam means wherein simultaneous rotation of first cam means and second cam means produce simultaneous X movement and Y movement of the lens with respect to the tool with a generally smooth Lissajous figure.

4,521,995

WAFER ATTRACTING AND FIXING DEVICE

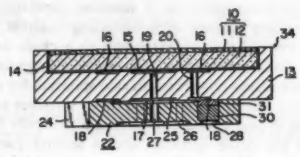
Shinji Sekiya, Tokyo, Japan, assignor to Disco Co., Ltd., Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,318

Claims priority, application Japan, May 23, 1980, 55-068471; May 23, 1980, 55-071025

Int. Cl.³ B24B *41/06*

U.S. Cl. 51—235 **4 Claims**



1. A wafer attracting and fixing device, comprising: a work head including a base seat having air sucking holes and on which is provided an attracting disc which receives a wafer and fixes the wafer to the attracting disc by sucking of air from the attracting disc through said air sucking holes, wherein said attracting disc comprises at least two layers, including an upper layer and a lower layer, of porous inorganic substance, the upper layer carrying the attracting surface and having fine pores, the lower layer being adjacent the base seat and having coarse pores, the upper and lower layers of the attracting disc being comprised of alundum grindstone grains sintered under pressure and having different grain size for respective said layers.

4,521,996

CENTRIFUGAL THROWING WHEEL FOR EJECTION OF BLASTING MATERIALS ONTO WORKPIECES

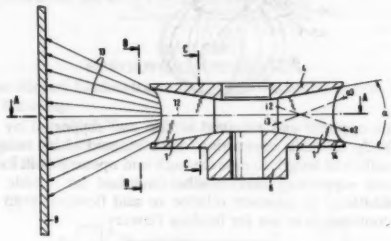
Peter Grund, Ekrath, and Peter Holz, Linnich, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,719

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3309941

Int. Cl.³ B24C *5/06*; F04D *29/24*

U.S. Cl. 51—434 **12 Claims**



1. In a centrifugal throwing wheel for the ejection of blasting material onto the workpieces to be processed including two spaced discs forming a V-shaped slot widening outwards at an angle α and with radial vanes arranged between said discs, the improvement being said vanes being arranged in a plurality of uniformly spaced sets of diametrically opposite vanes, the ejection surfaces of one of said sets of vanes having a concave curvature with a curvature axis inclined to the plane of rotation at an acute angle greater than $\alpha/2$, and the ejection surfaces of another of said sets of vanes being curved with a curvature axis inclined toward the other side of said plane of rotation.

4,521,997

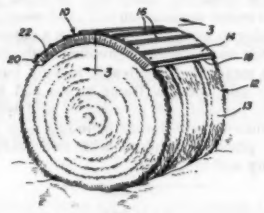
HAY BALE COVER

Harvey L. Tiberend, R.R. #1, Box 97, O'Fallon, Ill. 62269

Filed Feb. 2, 1983, Ser. No. 463,273

Int. Cl.³ E04B *1/347*

U.S. Cl. 52—3 **7 Claims**



1. A cover on a cylindrical hay bale with a preselected radius of curvature, wherein the cover comprises a longitudinally straight and transversely arcuate panel formed with a predetermined radius of curvature less than said preselected radius and overlying a portion of the cylindrical surface of said hay bale, said panel being constructed with longitudinal rigidity and arcuate flexibility to enable the normal radius of curvature of the panel to be increased and fitting snugly onto the hay bale, said panel including resilient characteristics to grippingly engage and cling to the hay bale when the radius of curvature has been increased from normal and then released to enable the cover to be mounted on the hay bale and retained thereon

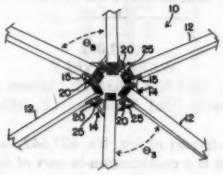
solely by frictional gripping engagement and without tie-downs.

4,521,998

UNIVERSAL HUB FOR GEODESIC TYPE STRUCTURES

David M. DeLorme, 356 Range Rd., Cumberland, Me. 04021

Filed Jul. 8, 1983, Ser. No. 512,154
Int. Cl.³ E04B *1/32, 1/40*
U.S. Cl. 52—81 21 Claims



1. A new hub structure for securing struts at the vertices or nodes where a plurality of struts converge in a geodesic type spatial framework, said struts having inner and outer edges with reference to the spatial enclosure and side surfaces facing each other comprising:

a plurality of universal connectors, each connector comprising a pair of hinge faces, said hinge faces positioned on the facing side surfaces of adjacent chords converging at a vertex of the geodesic type spatial framework, each hinge face secured in parallel at the side surface of the corresponding strut at a single pivot point for rotation of the hinge face relative to the side surface of the strut during placement and orientation of struts in the geodesic type spatial framework, said universal connectors further comprising hinge ears extending from the sides of each hinge face for defining a hinge axis offset from the plane of the corresponding hinge face, said hinge ears from adjacent hinge faces of a universal connector overlapping and coinciding to define a common hinge axis between the respective hinge faces and offset from the planes of the respective hinge faces whereby said universal connectors may rotate in a first degree of freedom around the hinge axis and in second and third degrees of freedom about the pivot points securing said hinge faces at the facing side surfaces of adjacent struts whereby each said universal connector comprises a universal joint between adjacent struts converging at a vertex of the geodesic type spatial framework;

said plurality of universal connectors securing adjacent pairs of converging struts at the side surfaces facing each other to form a closed ring of universal connectors and converging struts at each vertex of the geodesic type spatial framework, said closed ring of universal connectors and converging struts forming a universal hub at each vertex of the geodesic type spatial framework in which the converging angles between adjacent struts may differ and may be varied and whereby the depth of the apex of the vertex from an underlying plane may be varied by the articulation angles of the struts relative to a plane;

said universal hub at each vertex of the geodesic type spatial framework thereby permitting the enclosure of a space with chords of variable length, variable converging angles relative to each other, and variable articulation angles, for forming a plurality of different irregular triangles in the geodesic type spatial framework by pivoting of hinge faces about the hinge axes and rotation of hinge faces relative to side surfaces of the struts;

said universal connectors further variable in the spacing of the respective hinge faces from the ends of the struts for varying the spacing of the ends of the struts relative to each other and for extending a strut substantially beyond the vertex if desired;

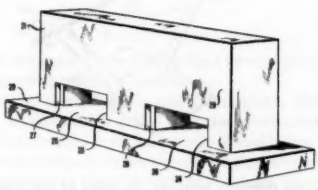
said hinge faces of the universal connectors and said side surfaces of the respective struts being constructed and arranged so that the hinge faces lie within the inner and outer edges of the respective struts for each operative rotational position of the universal connectors relative to the facing side surfaces of adjacent struts so that there is no interference by the universal connectors and universal hub with any inner or outer skin affixed to the inside or outside edges of the respective struts for any operative angular position of the universal connectors thereby permitting enclosure of irregular or odd spaces with a geodesic type spatial framework.

4,521,999

INTERMENT ARRANGEMENTS FOR CREMATED REMAINS

Elaine W. Flanagan, Norwich, N.Y., assignor to Starmax, Inc., Satellite Beach, Fla.

Filed Apr. 23, 1982, Ser. No. 371,262
Int. Cl.³ E04H *13/00*
U.S. Cl. 52—103 25 Claims



1. An above-ground interment arrangement for cremated remains contained in remains vessels, the arrangement having a plurality of repository chambers adapted for receiving the remains vessels, the arrangement comprising:

foundation means having an upper surface for supporting the remains vessels, a portion of said upper surface forming a lowermost internal surface of the repository chambers; and

monument body means cut integrally from a unitary block, said monument body means having a base surface plane and a first lateral facia, said base surface plane having a plurality of inwardly notched portions so as to be open with respect to said base surface plane and said first lateral facia, said notched portions forming an uppermost internal surface of the repository chambers, said monument body means being arranged on said foundation means with said flat surface of said foundation means in contact with said base surface of said monument body means, said notched portions of said monument body means and said upper surface of said foundation means defining the repository chambers, access to the repository chambers being had through said openings in said first lateral facia.

4,522,000

EARTHQUAKE SAFETY SUPPORT FOR TRANSPORTABLE BUILDING

Fred S. Barari, 1941 Hamilton Ave., San Jose, Calif. 95125

Continuation-in-part of Ser. No. 259,867, May 4, 1981, abandoned. This application Apr. 29, 1982, Ser. No. 372,974
Int. Cl.³ E02D *27/34*
U.S. Cl. 52—167 6 Claims

1. A stabilizing support for the transportable building, the underside of the building having a plurality of parallel beams arranged to be supported above the ground, said support comprising:

a base disposed for resting on the ground, said base having a single planar vertically extending flange;

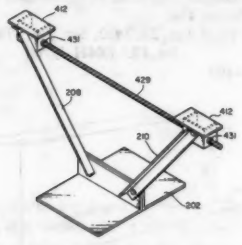
a pair of rigid support arms of substantially equal length, each of the support arms extending diagonally upward from the base for attachment to a first beam, each of the

support arms having a lower end affixed to the vertically extending flange of the base and an upper end disposed to be connected to said first beam with both support arms in a vertical plane;

a single rigid stabilizing arm extending diagonally upward from the base to a second beam, having one end affixed to the vertically extending flange of the base and the other end disposed to be connected to said second beam; and

bracket means for engaging at least one of the upper end of the stabilizing arm and the upper end of each of the first pair of support arms to the first and second beams, respectively; and clamp means including:

a pair of clamp halves each having a top lobe and a bottom lobe, the top lobe having a smaller vertical dimension than the bottom lobe, between said top and bottom lobes there is defined a parabolic concave inner surface wherein the



shortest distance between the ends of the concave inner surface is greater than the combined thickness of the portion of the bracket means and the first and second beams to be clamped, each of said clamp halves also defining a hole extending through the bottom lobe substantially parallel to the major parabolic axis of the concave inner surface;

double threaded bolt means of a selected length to span the width of the beam to which the bracket means is being clamped and to pass through the hole in each of the clamp halves and to extend beyond the convex outer surface of same; and

a pair of nuts screwed onto opposite ends of the double threaded bolt means for tightening the clamp halves around the portions of the bracket means and being clamped together.

4,522,001

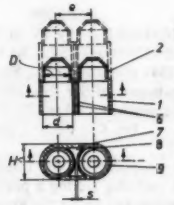
SET OF BRICKS WITH PLUGGING CONNECTIONS

Anton Meyer, Gratzerstrasse 3, D-8070 Ingolstadt 2, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,228

Int. Cl.³ A63H *33/08*

U.S. Cl. 52—309.1 **12 Claims**



1. In a set of synthetic resin bricks with plugging connections, with side walls having rounded brick corners and with at least one cylindrical male element on one covering wall part and an equal number of female pockets for such male elements on an opposite side, the inner part of the many element bricks being reinforced by bracng walls, wherein the brick material is a soft synthetic resin having good gripping properties, keeping its form, resistant to abrasion and keeping to the condition of laws on the use of synthetic resin in connection with foodstuffs and wherein the female pockets are formed by sleeve-like wall parts which at the outer sides of the bricks take the form of the rounded off brick corners and in the inner part of the many-element bricks, limited by the straight side walls, take the form of the bracing walls and wherein the walls are relatively thin as compared to the dimensions of the synthetic resin bricks.

4,522,002

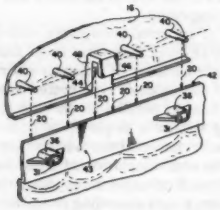
WALL PANELS

Wilfrid E. Davis, 1251 NW. 165th St., Miami, Fla. 33169, and Richard A. Davis, 7301 Poinciana Ct., Miami Lakes, Fla. 33014

Continuation-in-part of Ser. No. 422,642, Sep. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 378,629, May 17, 1982, abandoned. This application Jun. 15, 1983, Ser. No. 504,618

Int. Cl.³ E04D *1/00, 3/363*

U.S. Cl. 52—309.1 **5 Claims**



1. A panel body for covering a wall, comprising:

(a) a thin, generally rectangular body having top and bottom horizontal edge regions and left and right vertical edge portions,

(b) said top region having a plurality of holes for receiving nails for affixing said panel to said wall; and

(c) said bottom region having a plurality of upwardly recessed projecting flanges forming with said panel body a plurality of slots and a plurality of projecting bendable pins, said slots dimensioned and oriented to engage the top region of a second body, and said pins located so that;

(i) said second panel body top region may partially engage said slots while abutting said pins, and

(ii) said second panel body top region may fully engage said slots only when said pins contain an upward bend.

4,522,003

TILES AND ARRANGEMENT FOR SETTING TILES

Shigeyuki Akihama, Sagamihara; Hajime Koizumi, Tokyo; Yoshihiko Umeki, Kure; Makoto Saito, Kawasaki; Tadashi Banno, Fuchu, and Shinya Tateno, Yokohama, all of Japan, assignors to Manten Co., Ltd., Osaka and Kajima Corporation, Tokyo, both of, Japan

Filed Apr. 19, 1983, Ser. No. 486,542

Claims priority, application Japan, Apr. 19, 1982, 57-58075; Apr. 19, 1982, 57-58076

Int. Cl.³ E04F *13/08;* **E04B** *5/52*

U.S. Cl. 52—391 **5 Claims**

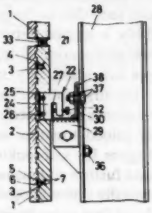
1. An arrangement for setting tiles on a surface to be tiled, comprising:

tiles having dovetail grooves in rear surfaces and being secured to mortar applied to said rear surfaces,

a plurality of anchors engaging said dovetail grooves in the rear surfaces of the tiles and being embedded in the mortar,

a plurality of hooks being partially embedded in the mortar and having rear ends projecting rearwardly out of the mortar,

each of said plurality of hooks having a base plate, side plates extending from both ends of the base plate and having



holes therein, and rod means, inserted into the holes in the side plates, for retaining each of the plurality of hooks partially embedded in the mortar; and

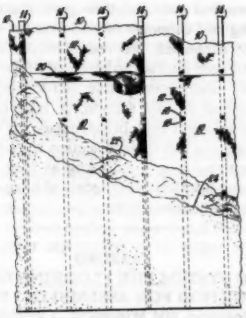
horizontal beams being fixedly mounted on the surface to be tiled and having the rear ends of all of said plurality of hooks secured thereto.

4,522,004

INSULATED WALL CONSTRUCTION

Michael E. Evans, and Bradley W. Oberg, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 16, 1983, Ser. No. 505,145
Int. Cl.³ E04B *2/08*
U.S. Cl. 52—409 **8 Claims**



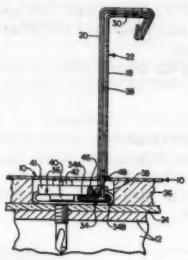
1. An insulated outer wall construction for a building, said wall construction comprising a structural outer wall, a plurality of elongated rectangular fibrous glass insulation boards mounted, with longer edges extending vertically, in covering relationship to said outer wall on a side thereof facing outwardly of the building, each of said boards being devoid of a vapor barrier and having a scrim adhesively secured thereto on an outer side thereof, the scrim including a flap along one vertical edge of the board overlapping a joint between the board and an adjacent board, fastening means mechanically securing said boards and scrim to said outer wall, and a coat of cementitious material covering said boards, scrim, and fastening means.

4,522,005

CLIP CONNECTOR FOR BUILDING PANELS HAVING INTERLOCKED SECTIONS

Paul A. Seaburg, and Warren E. Mueller, both of Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Oct. 25, 1983, Ser. No. 545,358
Int. Cl.³ E04D *1/34*
U.S. Cl. 52—544 **13 Claims**



1. A clip connector for anchoring rigid interlocked panels to spaced supporting members comprising:

(a) a body portion having an upstanding planar element, an upper portion which mates with the interlocked panels, and a base formed from the bottom of said planar element and being substantially perpendicular thereto and extending therefrom to form toe and heel portions, respectively;

(b) a washer member slidably engaged on said base and projecting outwardly therefrom, said washer member having a first portion overlying said toe and a second portion associated with said heel and underlying said base, and an aperture extending through said first and second portions exteriorly of said base; and

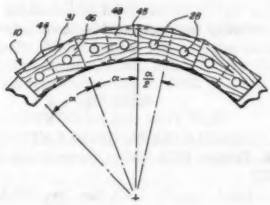
(c) a fastener extending through said aperture for securing said washer member to a supporting member, said fastener forcing said first and second portions of said washer member into restrained but slidable engagement with said base; whereby during movement of said panels, said panels are allowed to move with respect to said supporting members as said base moves with respect to said washer member.

4,522,006

DRUM AND DRUM BODY FORMED FROM ADHERED, SOLID BLOCKS OF WOOD

Keith A. Plikuhn, 6618 S. Richmond St., Chicago, Ill. 60629

Filed Jun. 13, 1983, Ser. No. 503,691
Int. Cl.³ E04C *1/30*; B27F *7/00*
U.S. Cl. 52—585 **34 Claims**



1. A drum comprising:

(A) a plurality of solid wood blocks permanently adhered to each other, said adhered blocks forming a solid surface having the shape of a cylinder with two open ends, each of said blocks extending from the inside to the outside of said

cylinder, each of said two ends of said cylinder defining a substantially flat plane;

(B) a drum head in contact with one of said ends of said body; and

(C) stretching means, coupled to said head, for retaining said head under pressure against said one end.

26. A method of making a drum body comprising:

(A) adhering together a plurality of solid wood blocks having substantially flat faces to form a solid surface having the shape of a cylinder with two open ends, with each of said blocks extending from the inside to the outside of said cylinder; and

(B) smoothing the outer surface of said cylinder.

4,522,007

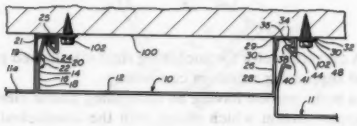
INTERLOCKING BUILDING PANEL

James A. Oehlert, R.R. 3, Box 396-F, Longview, Tex. 75603

Filed Nov. 17, 1983, Ser. No. 552,611

Int. Cl.³ E04C *1/10, 1/30;* **E04D** *3/362*

U.S. Cl. 52—588 **6 Claims**



1. An interlocking building panel comprising:

(a) an intermediate portion; and

(b) first and second interlocking portions at respective sides of said intermediate portion with each interlocking portion being adapted for interlocking engagement with an interlocking portion of an adjacent panel;

(c) said first interlocking portion being formed to define:

(1) a first side wall which includes:

(i) a lower segment extending upwardly from said intermediate portion;

(ii) an upper segment extending upwardly and inwardly from said lower segment at an obtuse, inwardly included angle; and

(2) a first lip extending inwardly from said upper segment; and

(d) said second interlocking portion being formed to define;

(i) a second side wall extending upwardly from said intermediate portion;

(ii) an upper wall extending outwardly from said second side wall in offset relation to said intermediate portion, said upper wall being adapted for fastening to adjacent supporting structure;

(iii) a leg depending from said upper wall; and

(iv) a second lip extending inwardly from said leg, with an inner edge of said second lip being sufficiently spaced apart from said second side wall to permit a first lip of an adjacent interlocking panel to pass upwardly between said second side wall and said inner edge of said second lip.

4,522,008

CLIP FOR SELF-LOCKING COLLAPSIBLE/EXPANDABLE STRUCTURES

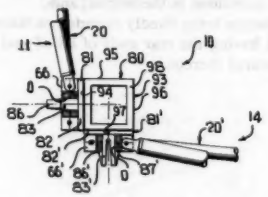
Theodore R. Zeigler, 9923 Indian Queen Point Rd., Oxon Hill, Md. 20022

Filed Aug. 19, 1982, Ser. No. 409,435

Int. Cl.³ E04H *12/18*

U.S. Cl. 52—646 **45 Claims**

1. A pair of adjacent collapsible, expandable, self-locking, self-supporting structures each comprising at least one section formed by a plurality of pairs of crossed rod elements pivotally joined in scissored fashion substantially midway between their ends, one rod element of each pair being pivotally joined at its opposite ends to two other rod elements of adjacent pairs of rod elements through associated hubs and the other rod element of said each pair being pivotally joined at its opposite ends to the remaining two rod elements of said adjacent pair of rod elements through associated hubs, whereby the pivotally connected ends of said pairs of rod elements lie and said hubs lie at corners of first and second similar polygons situated in spaced, parallel planes such that as the pairs of rod elements are scissored, the assembly is moved between a collapsed condition in which the first and second polygons are of contracted size and their planes are maximally spaced and an erected condition in which the first and second polygons are of expanded size and their planes are spaced relatively close, further rod means pivotally joined together and to the hubs at the corners of said polygons for self-locking said section in said erected condition, said further rod means comprising a first set of rod elements pivotally joined together at the plan view geometric center of said first polygon and extending therefrom to pivotally connect to hubs at the corners of said first polygon, said rod elements of said first set being of lengths such that they lie essentially in a common plane containing said hubs and



corners of said first polygon when said first polygon has expanded to a maximum size, said further rod means also including a second set of rod elements pivotally joined at hubs at corners of said second polygon and to intermediate portions of corresponding rod elements of said first set so that said rod elements of the second set can not be essentially in a common plane containing the corners and hubs of said second polygon even when the section is in erected condition, said rod elements of said second set being of lengths between their corner/hub-connected ends and their pivotal connections to the corresponding rod elements of said first set such that as said polygons are expanded, the rod elements of said first and second sets thereof interact to place all of the rod elements of said assembly under cumulative self-locking stress in said erected condition of said section, at least one hub of each section being adjacent each other, means for releasably securing said at least one hub of each section to each other, and said releasable securing means including at least two stems with each stem being interlockingly received in an associated opening of said last-mentioned hubs.

4,522,009

LOCK ROD SYSTEM FOR FLOORING GRATING AND METHOD FOR ASSEMBLING SAME

Conrad F. Fingerson, 604 Winona St., Chatfield, Minn. 55923

Filed Jan. 14, 1983, Ser. No. 458,034

Int. Cl.³ E04C *2/22, 2/42*

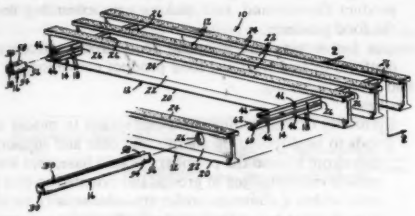
U.S. Cl. 52—667 **30 Claims**

1. A fiber reinforced plastic flooring grating, comprising:

(a) a plurality of spaced support members;

(b) spacer means for interconnecting said support members, said spacer means extending through aligned apertures defined in said support members, said spacer means including first and second members having a longitudinal extent, said second member being notched at intervals corresponding to the spacing between adjacent support members, the notches being adapted to engage said support members, said first and second members being securedly attached to one another by a substantially continuous

layer of adhesive dispensed along the longitudinal extent of said first and second members, said first and second



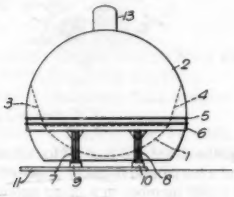
members cooperating to retain said support members at a predetermined spacing.

4,522,010

METHOD OF CONSTRUCTING A LARGE SPHERICAL TANK SUPPORTED BY A SKIRT ON LAND

Rolf F. Schrader, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Moss, Norway

Filed Mar. 28, 1983, Ser. No. 479,454
Claims priority, application Norway, Apr. 15, 1982, 821241
Int. Cl.³ E04G *21/14*
U.S. Cl. 52—745 **9 Claims**



1. A method of constructing a large, land-based, skirt-supported spherical tank comprising the steps of, prefabricating said tank initially in two sections at a fabrication site by forming an upper, greater than hemispherical, tank section including a skirt support element and a bottom polar cap section, said upper tank section and said bottom polar cap section having complementary edges adapted to be joined at an erection site to form the completed tank, said edges defining a diameter smaller than the diameter of the completed tank, transporting the prefabricated tank sections to the erection site while supporting the bottom polar cap section inside of the upper tank section thereby reducing the height of the unit during transportation, lowering the bottom polar cap section at the erection site into position with said edges aligned and thereafter securing said bottom polar cap section to the upper section of the tank shell.

4,522,011

CONTINUOUS MOTION PACKER CONTROLLER

Barton M. Bauers, 30 Hillock Dr., Wallingford, Conn. 06492; John L. Raudat, Old Madison Rd., North Madison, Conn. 06443; Raymond C. Ehlers, Old Turnpike Rd., Haddam, Conn. 06438, and Timothy H. Thompson, Meetinghouse Hill Rd., Durham, Conn. 06422

Filed Dec. 27, 1983, Ser. No. 565,412
Int. Cl.³ B65B *35/54, 57/14*
U.S. Cl. 53—55 **5 Claims**

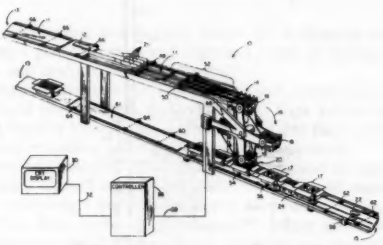
1. In a packer of the type having conveyor means for advancing a plurality of articles along a first horizontal path, an infeed station, a grid structure for receiving said articles at said infeed station, a discharge station, case conveyor means for delivering upwardly open packing cases to said discharge station along a second horizontal path, means for moving said grid structure from said infeed station to said discharge station, means for releasing said articles from said grid structure at said discharge station causing said articles to drop into said packing cases and a controller for operating said packer, said controller comprising:

controller instruction storage means for storing a plurality of controller instructions capable of directing packer operation;

a plurality of article position detectors associated with said article conveyor means and providing article present control signals to indicate the presence of an article at each corresponding detector location, said detectors being spaced from one another at predetermined intervals along the article conveyor means;

means for sensing the presence or absence of said article present control signals addressed as to their locations;

at least one packing case position detector associated with



said case conveyor means, said case detector providing a case present control signal indicating the presence of at least one case at said corresponding detector;

means for sensing the presence or absence of said case present control signal;

at least one article blocking detector associated with said grid structure, said blocking detector providing a control signal to indicate whether one or more articles has failed to drop from its position in the grid;

means for sensing the presence or absence of said grid blocking control signal;

real time processing means for accessing said controller instructions in said controller instruction storage means and for executing certain of said instructions in response to said article and case detector control signals to effect one of a number of predetermined courses of action, and

means responsive to said real time processing means for causing said packer to operate in accordance with said predetermined course of action.

4,522,012

BAG INSERTER MACHINE

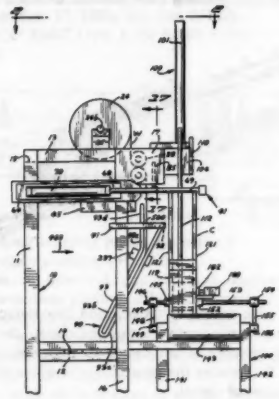
Rodney C. Nelson, Braham, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 311,525, Oct. 15, 1981, abandoned. This application Sep. 7, 1982, Ser. No. 415,791
Int. Cl.³ B31B *7/02*
U.S. Cl. 53—175 **42 Claims**

1. A bag inserter machine for separating a leading bag that is joined to a bag roll web of a bag roll along a perforated line and has opposite first and second side walls, a bag closure seal and a leading terminal edge remote from the perforated line and inserting the separated bag into an open case, the edge of the bag that was joined to the bag roll along the perforated line, after separation from the bag roll, defining the bag mouth, comprising a frame, first means on the frame for supporting the bag roll and feeding the leading bag joined to the bag roll to a preselected bag position, second means on the frame for engaging the bag in said preselected position, separating the bag from

the bag roll along the preforated line and opening the bag mouth while supportingly holding the bag, the second means including separating means mounted on the frame for movement from a datum first position to a bag supporting, bag mouth open second position for engaging the bag first side wall adjacent the perforated line, bag opening means mounted on the frame for movement between a bag mouth open first position remote from the bag spearating means in its second position and

a second position to abut against the bag second side wall when the bag separating means is in its first position and cooperate with the bag separating means to clampingly engage the bag while it is joined to the bag roll, said bag opening and bag separating means each including means for grippingly engaging the respective side wall of the bag



remote from the bag closure and holding the bag in a bag mouth open condition when the bag separating and opening means are in their bag open positions, inserter means mounted on the frame for movement from a datum position to a position the bag that was being held in a bag mouth open condition is inserted into the case for moving the leading bag into the case, and control means for operating the first means to feed the bag joined to the bag roll to said bag preselected position, then the bag opening and bag separating means to clampingly engage the leading bag while it is joined to the bag roll and move the leading bag relative the feed means to separate the leading bag along the perforated line from the bag roll and after the leading bag is separated from the bag roll move the bag side walls to a bag mouth open condition, and thereafter the inserter means to insert the bag into the case.

4,522,013

YIELDABLE PLATFORM FOR FOOD WRAPPING MACHINE

Glen T. Hamilton, Jacksonville, Tex., assignor to GME, Inc., Jacksonville, Tex.

Filed Jun. 30, 1983, Ser. No. 509,386
Int. Cl.³ B65B *11/26, 49/08*
U.S. Cl. 53—220 **1 Claim**

1. A food packaging apparatus, comprising:

a product food conveyor for moving unwrapped food products;

a wrapped food product conveyor for moving wrapped food products;

a wrapping dispenser for containing wrapping;

an elevator for moving the food products proximate said dispenser from said product food conveyor, said elevator having a platform disposed thereon for receiving the food product;

a tucking arm for causing said wrapping to enclose the food product therearound, said tucking arm extending under the food product;

means for moving the wrapped food product from said platform to said wrapped food product conveyor;

said platform having:

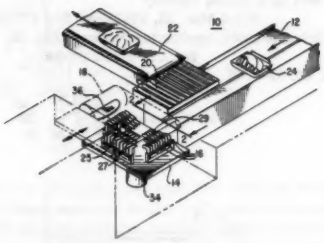
a base,

a plurality of longitudinal rods and means to mount said rods to be disposed parallel to said base and supported therefrom around the periphery of said base, said longitudinal rods arranged in groups and oriented so that the rods within a common group are substantially parallel to each other and are oriented at right angles to the rods in each of the groups adjacent thereto;

each of said longitudinal rods having a plurality of pivoting members mounted thereon in spaced apart relationship for rotating thereabout, each of said pivoting members having;

a bearing for rotation about said longitudinal rod,

a radial member having one end thereof disposed on said



bearing, the distal end thereof for traversing an arcuate path and a horizontal member disposed on the distal end of said radial member in a plane tangential to the rotational path of said radial member, said horizontal member having tapered trailing and leading edges, the surface of said horizontal member distal to said bearing having an arcuate shape;

said pivoting members on each of said longitudinal rods disposed to pivot in the direction of motion of said tucking arm to mesh with pivoting members on adjacent ones of said rods when said tucking arm passes under the food product and contacts the trailing edges of said pivoting members, the tapered trailing and leading edges preventing binding upon meshing of said pivoting members, all of said pivoting members on one of said longitudinal rods pivot synchonously such that pivoting of one of said pivoting members causes pivoting of all of said pivoting members on a common longitudinal rod; and

a spring disposed on each of said longitudinal rods and attached to said pivoting members to return said pivoting members to their original position after withdrawal of said tucking arm.

4,522,014

ON-BOARD FLAP OPENER

Chris E. Robinson, Akron, Ohio, assignor to Figgie International, Willoughby, Ohio

Filed Nov. 10, 1982, Ser. No. 440,633
Int. Cl.³ B65B *43/26, 43/38*
U.S. Cl. 53—382 **12 Claims**

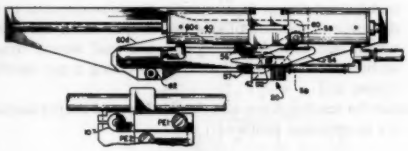
1. In a flap opener apparatus, a travel cylinder, having a longitudinal axis, movable parallel to a fixed carton moving path,

a shaft operatively carried by said travel cylinder and positioned normal to said longitudinal axis thereof,

a flap opening device, a control cam, and a control roll all operatively positioned on said shaft;

a control slot engaging said control roll and operable to move said shaft arcuately,

a powered rotor means operatively connected to said shaft to urge it through an arc when said shaft is free to move, and



a cam operating member positioned to engage said control cam and move said shaft and said flap opener device through an arc to open a flap when said travel cylinder has moved to adjacent a limit of its travel and has said device under a flap of a case.

4,522,015

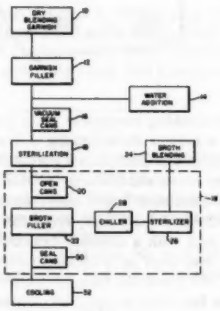
PHASED ASEPTIC STERILIZATION AND PACKAGING PROCESS AND SYSTEM

William M. Hildebolt, Mickleton, N.J., assignor to Campbell Soup Company, Camden, N.J.

Continuation of Ser. No. 221,850, Dec. 31, 1980, abandoned. This application Jan. 6, 1983, Ser. No. 456,248

Int. Cl.³ B65B *55/02*

U.S. Cl. 53—425 **21 Claims**



1. A method for sterilizing and packaging a product having solid and liquid components, comprising the steps of:

(a) placing the unsterilized solid component into a container in which the product is ultimately sealed;

(b) temporarily closing the container;

(c) heating the contents of the container to effect sterilization thereof;

(d) opening the container in a sterile environment, to prevent contamination of the contents;

(e) filling the container in said sterile environment with aseptically sterilized liquid component which is cooler than the solid component to quench the hot solid component; and

(f) sealing the filled container in said sterile environment.

4,522,016

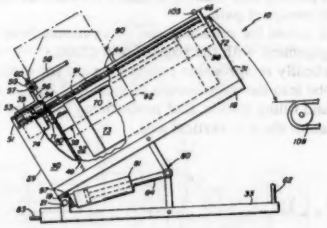
CARTON SUPPORT AND ERECTION MACHINE

Mark A. DiRico, 416 Adams St., Quincy, Mass. 02169

Filed Sep. 30, 1983, Ser. No. 537,987

Int. Cl.³ B65B *43/26*

U.S. Cl. 53—564 **19 Claims**



1. An erecting and holding device for a shipping carton having a pair of bottom end flaps and a pair of bottom side flaps, said device comprising

a support structure for supporting a said, carton in an upright position with said bottom end flaps folded into a generally horizontal position and said side flaps unfolded and extending generally vertically downwardly,

a pair of folding members, mounted below and on opposite sides of said support structure, each of said members comprising a surface attached to a first drive means, said first drive means being adapted to swing said folding-member surfaces from a vertical position to a substantially horizontal position,

tilt means for moving said support structure between a first position in which a carton supported thereby is substantially horizontal and a second position in which a carton supported thereby is inclined with respect to the horizontal, and for supporting said support structure in said second position, said tilt means comprising a member connecting said support means to a horizontal member and said connecting member being hinged at a point which is connected to a reciprocating piston rod, whereby movement of said rod flexes said hinge, altering the effective length of said connecting member to change the height of said support means in the vertical plane through said point of connection between said support means and said member,

discharge means for discharging a carton supported by said support structure from said support structure, said discharge means comprising a U-shaped engaging member to engage one end of, and to extend at least partially around the sides of, a said carton, and a second drive means communicating with said U-shaped member to move it between a first position in which it is positioned to engage one end of a said carton supported on said support structure, and a second position spaced generally horizontally from said first position whereby movement of said member from said first position to said second position will move a said carton off of said support structure and discharge it, said second drive means being mounted along one side of said device, and

control means for activating selected ones of said first drive means, said second drive means, and said tilt means.

4,522,017

REGISTRATION OF BAGS IN A FILLING MACHINE

Richard W. Scheffers, Mount Prospect, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Sep. 30, 1982, Ser. No. 429,506

Int. Cl.³ B65B *43/26*

U.S. Cl. 53—570 **2 Claims**

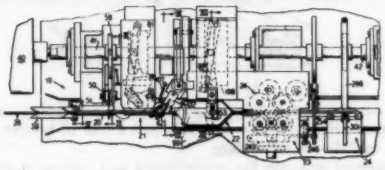
1. A device for assuring the proper registration of each bag of a laterally connected bag chain in a filling station of a mech-

anism for automatically filling bags one at a time conducted laterally therethrough along a transport path, said bags being vertically draped in said chain and each having closed bottom end and side edges and a sealable upper end mouth which is open in said filling station, said apparatus comprising:

drive means for frictionally engaging the bags of said chain and passing said chain in at least a forward direction along said transport path,

clutch means for releasing said drive means from frictional engagement with the bags of said chain,

A vertically reciprocable probe, a means for extending said probe into the open mouth of each said bag of said chain in said filling station, said probe being mounted for lateral rotation about a vertical axis,



a stop for limiting rearward rotation of said probe, and

a resilient force means for biasing said probe against said stop, when said clutch means is engaged, the resilient force means acting on said probe for drawing said chain rearward along said transport path to a predetermined registration point set by said stop,

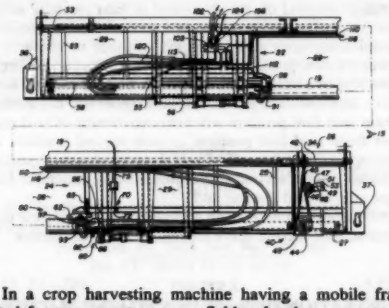
whereby said drive means overtravels said chain forwardly along said transport path relative to said filling station and insertion of said probe into said bag mouth enables said drive means to rotate said probe forwardly along with said chain until said clutch means disengages said drive means whereupon said chain is indexed back to said registration point permitting a bag about to be filled to be properly located in said filling station.

4,522,018

WINDROW REVERSER FOR WINDROWER DRAPER HEADER

Edward A. Blakeslee, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 16, 1983, Ser. No. 532,932
Int. Cl.³ A01D *35/12, 57/20*
U.S. Cl. 56—181 **15 Claims**



1. In a crop harvesting machine having a mobile frame adapted for movement across a field; a header connected to said frame to collect crop material from the ground and initiate the crop harvesting process, said header having first and second laterally shiftable draper sections, each said draper section including a draper rotatable in a transverse direction to laterally convey crop material thereon, each said draper section being laterally shiftable between a left position and a right position; first and second hydraulic motors operatively connected to said first and second drapers, respectively, for the selective rotation thereof in first and second opposing directions; and a hydraulic circuit for supplying hydraulic fluid under pressure to said hydraulic motors, the improvement comprising:

a reversing valve connected to said hydraulic circuit in association with said second hydraulic motor for reversing the flow of fluid through said second motor to cause said second draper to rotate in a direction opposite to the direction of rotation of said first draper under conditions where said first draper section and said second draper section are in opposing positions, creating a gap therebetween; and

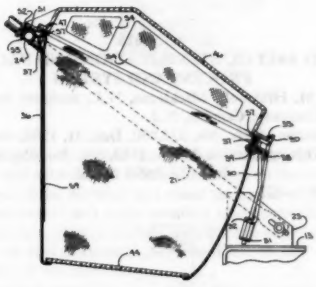
means for sensing when said first and second draper sections are in opposing positions.

4,522,019

GRASS CATCHING RECEPTACLE

Merle L. Edwards, Port Washington; Wayne A. Meyer, Plymouth, both of Wis., and James M. Shook, San Jose, Calif., assignors to Bolens Corporation, Port Washington, Wis.

Filed Aug. 1, 1983, Ser. No. 519,532
Int. Cl.³ A01D *35/22, 53/06*
U.S. Cl. 56—202 **19 Claims**



1. A grass catching receptacle for a power mower of the type having a mower deck, having a bag support on a rear portion of the mower deck, having a discharge chute with an exit that opens above and towards the rear of the mower deck, and having a handlebar frame with two laterally spaced legs rising upwardly and rearwardly from the rear portion of the mower deck and with a crossbar extending across the space between the two legs at a location above and behind the mower deck, the grass catching receptacle comprising:

a collection bag with an upwardly opening mouth, the collection bag having a body that is formed at least in part by a flexible fabric, and the collection bag having a rigid bag frame disposed around the mouth,

wherein the bag frame is wider than the space between the legs of the handlebar frame, but shorter in length than the distance from the bag support to the crossbar, so that the bag frame is supportable on the bag support and the legs of the handlebar frame without covering the crossbar; and

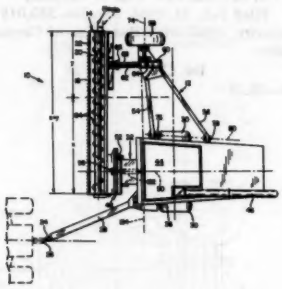
a rearwardly pivoting, stiff, flip-top lid for covering the mouth of the collection bag, with means at a rear end of the lid for pivotably mounting the lid to the crossbar of the handlebar frame; and

wherein the collection bag and the lid have portions cooperating to form an entrance at the exit from the discharge chute, so that matter discharged therefrom will be collected and contained within the receptacle.

4,522,020
WHEAT COMBINE

Steven A. Anderson, Star Route, Arlington, Oreg. 97812

Filed Jun. 4, 1984, Ser. No. 616,903
Int. Cl.³ A01D 75/28
U.S. Cl. 56—209 9 Claims



1. A pulled combine of the type having a laterally extending header with proximal and distal ends, and a wheeled feeder/separator assembly extending rearwardly from said header, wherein the improvement comprises:

circle means mounted to said header adjacent a rearward facing portion of said proximal end, for facilitating pivoting of said header along a longitudinal axis extending through the center of said circle means;

a frame member pivotally mounted to and extending laterally outwardly from said feeder/separator assembly to support said distal header end, said frame member defining a frame member pivot axis extending at a rearwardly converging angle with respect to said longitudinal axis;

header support wheel means rotatably mounted to said frame member and disposed laterally outwardly from said frame member pivot axis for supporting weight from said header; and

vertical pivot means defining a substantially vertical pivot axis disposed adjacent said circle means for facilitating the pivoting of said header as said frame member pivots upwardly and downwardly along said frame member pivot axis.

4,522,021
STATIONARY SPINDLE BRAKE FOR SPINNING AND TWISTING SPINDLES

Günther Schmitt, Hammelburg, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,514
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320458
Int. Cl.³ D01H 7/22
U.S. Cl. 57—88 12 Claims

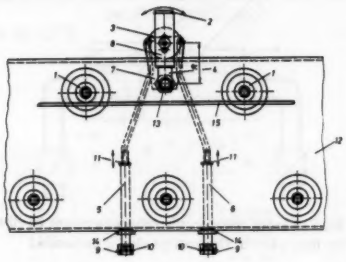
1. A spindle brake for braking a selected one of a pair of spinning spindles, wherein the pair of spindles are supported on support rail means; a belt for contacting the spindles and moving therepast to spin both of the spindles of the pair;

the brake comprising:

a holder pivotally mounted to the rail means between the spindles of the pair, the holder being pivotable toward either spindle;

a brake element mounted on the holder and pivotable therewith; a brake surface on the brake element, the brake surface being so placed on the brake element and the brake element being so placed and shaped that upon rotation of the holder around its pivot in one direction, the brake surface contacts one of the spindles to rub and brake the one spindle, and upon rotation of the holder around its pivot in the opposite direction, the brake surface contacts the other spindle to rub and brake the other spindle;

a belt lift-off roller supported to the holder, spaced from the pivot of the holder, being near enough to the brake surface and being so shaped that upon pivoting of the holder in



the one direction, the belt lift-off roller contacts and raises the belt off the one spindle, and upon pivoting of the holder in the opposite direction, the roller contacts and raises the belt off the other spindle; and

means for pivoting the holder in the one and the opposite directions.

4,522,022
ROLLERS FOR FRICTION SPINNING APPARATUS

Alan Parker, Bolton, and William M. Farnhill, Burnley, both of England, assignors to Hollingsworth (U.K.) Limited, England

Filed Nov. 7, 1983, Ser. No. 549,023
Claims priority, application United Kingdom, Nov. 9, 1982, 8231908
Int. Cl.³ D01H 1/135, 7/882
U.S. Cl. 57—401 10 Claims

1. In a friction spinning apparatus comprising first and second rotatable members arranged in closely spaced relationship so as to define therebetween adjacent the line of closest approach a throat, and a fibre feed means for feeding fibres into the throat for twisting into yarn, the fibre feed means opening at one side of said line of closest approach at which said first rotatable member has its surface moving into said throat and the second rotatable member has its surface moving out of the throat;

the improvement wherein:

the surface of each of the rotatable members has a roughness characteristic of from 40 to 250 micro inches.

4,522,023
OPEN END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,391
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308249
Int. Cl.³ D01H 1/135, 1/12, 7/898
U.S. Cl. 57—401 15 Claims

1. Apparatus for open end friction spinning comprising:

two friction rollers arranged adjacent to one another to form a yarn forming wedge slot therebetween,

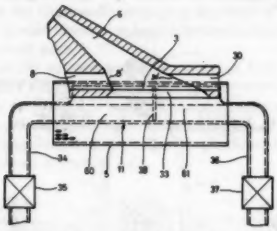
yarn withdrawing means for guiding the withdrawal of yarn from the wedge slot,

fiber feed channel means for guiding fibers to the region of the friction rollers,

transport air stream inducing means for inducing a flow of transport air to aid in the transport of the fibers in the fiber feed channel means,

and auxiliary air stream inducing means for inducing a flow

of auxiliary fiber transport air flowing in the yarn withdrawal direction in the region of the outlet opening of the



fiber feed channel means, whereby alignment of fibers to be spun into yarn in the wedge slot is enhanced.

4,522,024

METHOD FOR REDUCING THE AMOUNT OF NOX AND FOR RAISING THE OUTPUT OF A GAS TURBINE POWER STATION OF THE TYPE UTILIZING AN AIR RESERVOIR, AND A GAS TURBINE POWER STATION, OF THIS TYPE, OPERATING IN ACCORDANCE WITH THIS METHOD

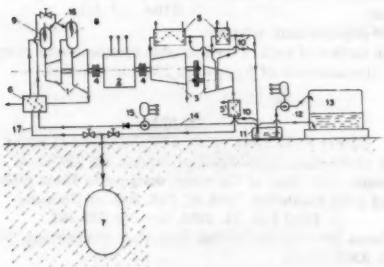
Paul Zaugg, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 8, 1982, Ser. No. 415,911

Claims priority, application Switzerland, Sep. 18, 1981, 6039/81

Int. Cl.³ F02C 7/143

U.S. Cl. 60—39.05 **1 Claim**



1. A method for reducing the amount of NO_x, and for raising the output of a gas turbine power station of the type having a gas turbine, a generator/motor, a compressor-group, moisture condenser means associated with said compressor group and an air reservoir, said method comprising the steps of:

collecting in an intermediate condensate tank the moisture condensed in said condenser means;

storing said collected moisture in a main condensate tank;

heating exchanging a portion of said stored moisture with waste gas from said turbine to evaporate said moisture; and

introducing said evaporated moisture into combustion chamber means of said turbine.

4,522,025

APPARATUS FOR CONTROLLING LOAD DISTRIBUTION AND SPEED OF GAS SPEED OF GAS TURBINE SYSTEMS AND PARTICULARLY OF GAS TURBINE ENGINES

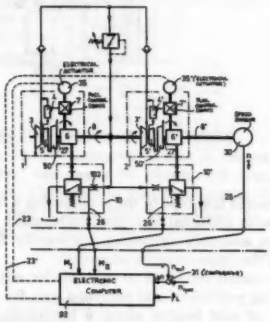
Christian Greune, Furstenfeldbruck, and Heinrich Kümmeke, Dachau-Etzenhausen, both of Fed. Rep. of Germany, assignors to MTU, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 582,015

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306889

Int. Cl.³ F02C 9/28

U.S. Cl. 60—39.15 **15 Claims**



1. In apparatus for controlling the load distribution and speed of gas turbine systems, and particularly of gas turbine engines each having an output shaft forming part of a common output shaft of the engines, a respective fuel control unit including a proportionally acting speed governor having adjustable speed set points, a master speed governor for the output shaft and a load distributing control unit, the master speed governors forming signals indicative of speed deviation of the engines, the load distributing control unit forming signals based on load deviation of the gas turbine engines and means for adjusting the speed set points of the proportionally acting speed governors in response to said signals, the improvement wherein the adjusting means comprises operational amplifier means for forming output signals from at least the speed deviation signals and the load deviating signals and summing amplifier means connected to said operational amplifier means for adding the output signals from the operational amplifier means to form signals $\rho_{spec}\,\rho'_{spec}$ for adjusting the speed set points of the proportionally acting speed governors.

4,522,026

POWER/TORQUE LIMITER UNIT FOR FREE TURBINE TYPE ENGINES

Gudmundur P. Peterson, Mont St. Hilaire, and Daniel d'Anjou, Montreal, both of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada

Filed Feb. 7, 1983, Ser. No. 464,402

Int. Cl.³ F02C 9/28

U.S. Cl. 60—39.281 **15 Claims**

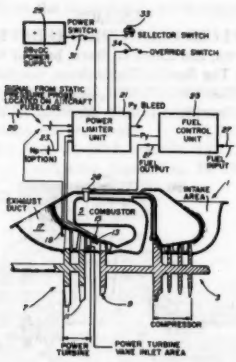
1. In a free turbine engine, which engine includes a power turbine having an inlet, an exhaust duct downstream of said turbine, an output shaft and a control valve for controlling engine power, the improvement comprising a power limit unit; said unit comprising:

first sensor means for measuring pressure at said inlet, said first sensor means being disposed in said power turbine inlet;

second sensor means for measuring temperature at said inlet, said second sensor means being disposed in said turbine inlet;

third sensor means for measuring power turbine exhaust pressure, said third sensor means being disposed in said duct;

processor means for calculating shaft horse power (SHP) from the measurements of said first, second and third sensor means;



means for generating a reference signal;

comparator means, for comparing SHP with said reference signal, said comparator means having output means;

the output means being connected to said control valve;

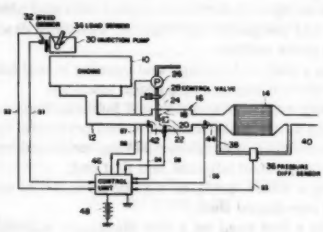
whereby, to reduce engine power when SHP is greater than said reference signal.

4,522,027

EXHAUST PARTICLE REMOVAL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yoji Hasegawa, Yokohama, and Motohiro Shinzawa, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 17, 1984, Ser. No. 581,071
Claims priority, application Japan, Feb. 21, 1983, 58-26307
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—274 **4 Claims**



4. A method of clearing an automotive exhaust filter of clogging, combustion particulates, comprising the steps of:

(a) supplying fuel to a burner disposed in an exhaust passage upstream of the filter;

(b) igniting the supplied fuel;

(c) detecting whether the fuel supplied to the burner is burning;

(d) if the fuel is not burning after ignition, cutting off the supply of fuel to the burner and repeating the steps (a), (b), and (c); and

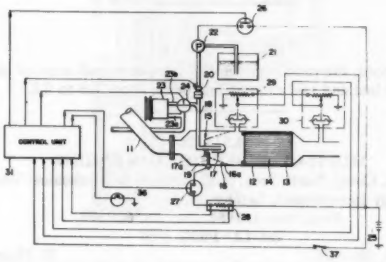
(e) if the fuel continues to burn for a predetermined period of time after ignition, cutting off the fuel supply to the burner.

4,522,028

REGENERATIVE BURNER CONTROL APPARATUS

Yoji Hasegawa, Yokohama, and Motohiro Shinzawa, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 21, 1984, Ser. No. 581,908
Claims priority, application Japan, Mar. 1, 1983, 58-31777
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—277 **6 Claims**



1. An apparatus for use in an internal combustion engine having an exhaust conduit for discharging exhaust particles together with exhaust gases to the atmosphere, and a trap located in said exhaust conduit for collecting exhaust particles, said apparatus comprising:

(a) a regenerative burner including a mixture supply device operable to supply a combustible mixture into said regenerative burner, and a glow plug operable to ignite and burn the combustible mixture supplied into said regenerative burner to burn the exhaust particles collected in said trap so as to regenerate said trap;

(b) a failure detector for detecting a broken wire in said glow plug, said failure detector including means for generating an inhibit signal in the presence of the broken wire in said glow plug; and

(c) first means for determining a regeneration requirement when said trap collects a predetermined amount of exhaust particles;

(d) a second means responsive to the determined regeneration requirement for operating said glow plug and for operating said mixture supply device for a predetermined period of time;

(e) third means responsive to the inhibit signal from said failure detector for preventing the operation of said mixture supply device.

4,522,029

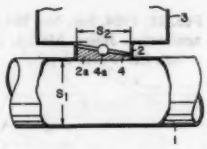
CONTROL SYSTEM OF EXHAUST FOR INTERNAL COMBUSTION ENGINE

Takao Tomita, Niiza; Masahiro Akiba, Tokyo; Hideki Toyota, Kamifukuoka, and Yasuo Terada, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,425
Claims priority, application Japan, Dec. 20, 1982, 57-223414
Int. Cl.³ F02B *27/02*
U.S. Cl. 60—314 **1 Claim**

1. Exhaust system control apparatus for an internal combustion engine having an exhaust line, a sub-chamber, a branch line on said exhaust line connecting the latter to said sub-chamber, and an opening and closing valve located on said branch

line, said valve being adapted to open when said engine operates at low speed and to close when said engine operates at



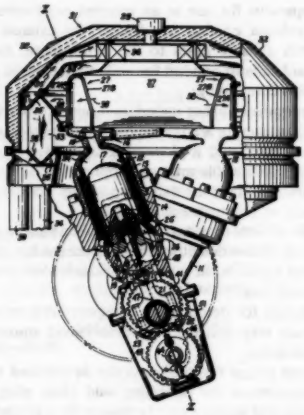
high speed, the ratio between the cross-sectional areas of said branch line and said exhaust line being about 0.6 to 0.8.

4,522,030

MULTI-CYLINDER HOT GAS ENGINE

John A. Corey, North Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 1, 1984, Ser. No. 605,855
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—525 **33 Claims**



1. In a multi-cylinder hot gas engine the combination comprising:

(a) equal V-shaped engine block having two banks of cylinders wherein the cylinders in each bank have parallel equal length axial centerlines and the planes containing such centerlines intersect along or near the axis of a single crankshaft mounted for rotation in said engine block;

(b) a piston in each cylinder connected with the crankshaft for reciprocation in said cylinder, each cylinder having an expansion space above the piston and a compression space below the piston;

(c) an annular regenerator means disposed around each cylinder;

(d) annular heater head means including a plurality of working fluid passageways disposed above the cylinders for supplying heated working fluid to the expansion spaces of all of the cylinders;

(e) combustor means centrally disposed in said annular heater head means for heating the working fluid in said plurality of working fluid passageways;

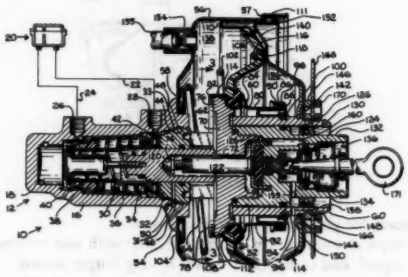
(f) a plurality of arcuate, balanced-flow manifold means one for each cylinder, each manifold means having a first arcuate portion in fluid communication with the expansion space of the cylinder and with one end of a number of working fluid passageways and having a second arcuate portion in communication with the annular regenerator means of the same cylinder and with the other end of said number of working fluid passageways and wherein the working fluid passageways thus intercommunicating within each of the plurality of arcuate manifold means are equal in number for each cylinder.

4,522,031

FLUID PRESSURIZING DEVICE

Oswald O. Kytta, and Lloyd G. Bach, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 17, 1981, Ser. No. 274,572
Int. Cl.³ F15B *13/16;* F16J *10/02*
U.S. Cl. 60—547.1 **8 Claims**



1. A method of assembling a fluid pressurizing apparatus comprising the steps of:

placing a piston assembly in a bore of a substantially cylindrical housing, said cylindrical housing having a peripheral guide surface with a first shoulder separated from a second shoulder, said cylindrical housing having first and second slots that extend from said bore to said guide surface;

locating a cup-shaped shell on said peripheral surface with an end wall positioned against said first shoulder, said cup-shaped shell having a cylindrical section extending from said end wall, said cylindrical section having a flange located thereon;

moving a hub member through said first and second slots until an opening therein is aligned with said piston assembly and peripheral lips thereon uniformly extend above said guide surface;

passing a push rod through said opening in said hub until an end thereof engages said piston assembly;

attaching a valve housing to said hub member;

securing a first end of a sleeve to said peripheral lips on said hub member, said sleeve having a second end and a groove thereon adjacent said first end;

locating a return spring on a guide on said first end wall of said cup-shaped shell;

locating a first bead on a first diaphragm assembly in said groove of the sleeve and a second bead adjacent said flange on said cylindrical section of cup-shaped shell;

attaching a third bead on a second diaphragm assembly to said second end of said sleeve and a fourth bead on the second diaphragm to said cylindrical housing, said cup-shaped shell, piston assembly, first and second diaphragm assemblies, sleeve, and hub member defining a first chamber;

positioning a disc-shaped shell on said cylindrical housing adjacent said second shoulder, said disc-shaped shell having a peripheral surface that engages said second bead on said first diaphragm assembly, said first and second diaphragm assemblies, sleeve, cylindrical housing and disc-shaped shell defining a second chamber;

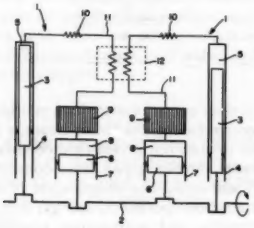
attaching a fastener to said cylindrical housing which engages said disc-shaped shell; and

applying a force to move said fastener and overcome said return spring to allow said peripheral surface on said disc-shaped shell to compress said second bead on said first diaphragm assembly against said flange on said cup-shaped shell and effectively sealing said first and second chambers from the surrounding environment.

4,522,032
STIRLING-CYCLE REFRIGERATOR

Kazuaki Nakamura, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 29, 1983, Ser. No. 527,223
Claims priority, application Japan, Sep. 24, 1982, 57-164847
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **2 Claims**



1. A Stirling-cycle refrigerator comprising:

(a) a plurality of Stirling-cycle refrigerator units, each having:

(1) a displacer defining an expansion chamber;

(2) a piston defining a compression chamber; and

(3) a circuit including a heater and a cooler and interconnecting said expansion chamber and said compression chamber;

(b) a countercurrent heat exchanger shared by said circuits and disposed between said coolers and said heaters for effecting heat exchange between working gases in said circuits; and

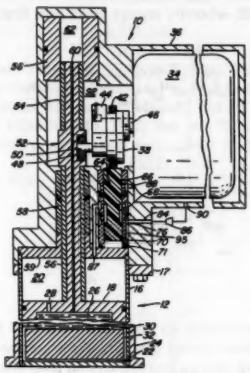
(c) a pair of regenerators connected in said circuits, respectively, in series with said countercurrent heat exchanger.

4,522,033
CRYOGENIC REFRIGERATOR WITH GAS SPRING LOADED VALVE

Jack E. Jensen, Columbus, Ohio, assignor to CVI Incorporated, Hilliard, Ohio

Filed Jul. 2, 1984, Ser. No. 627,581
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **9 Claims**

1. In a cryogenic refrigerator in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigerant fluid is circulated in a fluid path between the first chamber and the second chamber by movement of the displacer means, chamber means for guiding a slide connected to the displacer means, a motor connected to said slide for reciprocating said slide, a valve having a reciprocable valve member for controlling the flow of high and low pressure fluid, said valve member having a peripheral groove, said motor having an actuator arranged to move said valve member in timed relation with movement of said slide so that the valve member will introduce high pressure fluid via said groove into said first and second chambers when the displacer means is at one of the extremities of its movement, said valve member being solid, and means defining a gas spring which communicates with a port for receiving

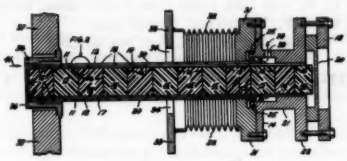


high pressure fluid for biasing said valve member toward said actuator.

4,522,034
HORIZONTAL CRYOSTAT PENETRATION INSERT AND ASSEMBLY

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,199
Int. Cl.³ F17C 1/00
U.S. Cl. 62—45 **27 Claims**



1. An insert for horizontal cryostat penetration comprising:

a thin wall, low thermal conductivity tube;

a plurality of foam plugs disposed within and substantially filling said tube; and

a plurality of thermally conductive foil patches disposed between at least two of said foam plugs.

4,522,035
METHOD AND APPARATUS FOR RECOVERING WASTE ENERGY

David Dyer, Auburn, Ala., and James L. Wise, Depere, Wis., assignors to TechMark Corporation, Newport, R.I.

Continuation of Ser. No. 227,774, Jan. 23, 1981, Pat. No. 4,437,316. This application Dec. 5, 1983, Ser. No. 558,014
Int. Cl.³ F25B 7/00
U.S. Cl. 62—79 **8 Claims**

1. A method for waste energy recovery comprising the steps of:

providing a common heat transfer surface;

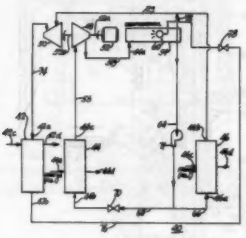
moving a first fluid containing waste energy along a first portion of said surface;

providing heat energy in a second fluid;

thereafter moving said second fluid along a second portion of said surface while retaining the first and second fluids totally isolated from one another;

providing a third fluid for receiving heat energy;

moving said third fluid along said heat transfer surface adjacent the first and second portions thereof while maintaining said third fluid totally isolated from said first and second



fluids are transferred to said third fluid, said first, second and third fluids being hot air, a refrigerant and water reintroducing energy into the second fluid after its energy is transferred to the third fluid.

4,522,036

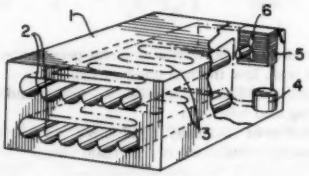
COOLING DEVICE

Antonius C. M. Van Gils, Etten-Leur, Netherlands, assignor to IE PE GE B.V., Etten-Leur, Netherlands

Filed Oct. 19, 1982, Ser. No. 435,248

Int. Cl.³ G05D *23/32*

U.S. Cl. 62—157 **1 Claim**



1. In a cooling system having compressor means, evaporator means for cooling a space and a lamella condensor for circulating refrigerant in a closed path, air displacing means for directing air normally in one direction over said lamella condensor to abstract heat from refrigerant flowing therethrough, and thermostat means for controlling said compressor means in response to temperature variations in said space being cooled, the improvement which comprises cycle means for cyclically causing air to flow over said lamella condensor in direction opposite said one direction independently of operation of said thermostat means whereby cyclic flow of air in said opposite direction over said condensor occurs even when cooling of said space is continuously demanded over a long period of time, including switch means for deenergizing said compressor means independently of said thermostat means so as to thaw said evaporator means, said cycle means periodically actuating said switch means so as to cause said compressor means to be deenergized.

4,522,037

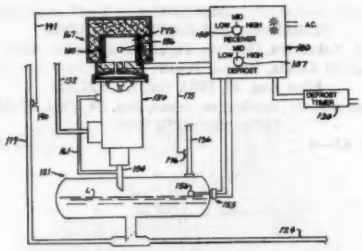
REFRIGERATION SYSTEM WITH SURGE RECEIVER AND SATURATED GAS DEFROST

Roland A. Ares; Steven J. Burpo, both of St. Charles, and Wayne G. Schaeffer, Creve Coeur, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.

Filed Dec. 9, 1982, Ser. No. 448,269

Int. Cl.³ F25B *41/04*

U.S. Cl. 62—196.4 **36 Claims**



1. A surge receiver control system for a multiple compressor refrigeration system having condenser means, a liquid header, a surge receiver in open refrigerant flow communication with said liquid header, branch liquid lines connecting multiple evaporators to said liquid line downstream of said surge receiver for refrigeration operations, and gas defrost means for selectively defrosting said evaporators; comprising a surge control valve disposed between the discharge side of the multiple compressors and said surge receiver in by-pass relation to said condenser means, said surge control valve including first means forming a closed pressure charge acting on said control valve in one direction to bias said valve toward an open position to establish fluid pressure communication between said compressors and said surge receiver, said first means being opposed by receiver pressure acting in the opposite directon for opening and closing said control valve in a modulating mode in response to a predetermined pressure differential thereacross, and said gas defrost means including second means for operating said surge control valve in a defrost mode different from said pressure differential in response to gas defrosting operations.

4,522,038

REFRIGERATING CYCLE APPARATUS

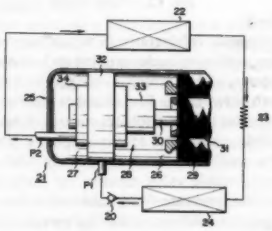
Masao Ozu, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,783

Claims priority, application Japan, Jun. 4, 1982, 57-96034

Int. Cl.³ F25B *1/00*

U.S. Cl. 62—228.5 **6 Claims**



1. A refrigerating cycle apparatus having a compressor having suction and delivery ports, a condenser connected to

said compressor delivery port, an evaporator connected to said compressor suction port, and a pressure reducing device connected between said condenser and said evaporator, said compressor comprising:

a compressor main body defining said suction and delivery ports, said main body being for compressing a refrigerant delivered therein;

means for defining a valve hole;

first connecting means for connecting said valve hole and said compressor suction port;

second connecting means for connecting said valve hole with said compressor delivery port;

third connecting means for connecting said valve hole and a suction port of said condenser; and

a valve plug movably mounted in said valve hole, said valve plug being adapted to move between a first position where said second connecting means communicates with said third connecting means through said valve hole in accordance with a difference in pressure at said suction port and said delivery port of said compressor when said compressor is in operation and a second position where said second connecting means does not communicate with said third connecting means through said valve hole when said compressor is stopped.

4,522,039

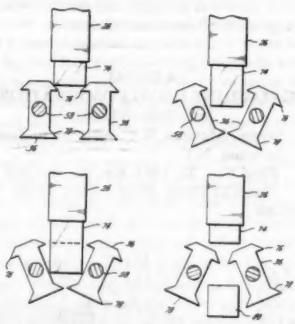
ICE CUBE MACHINE CUBE CUTTERS

John L. McNeill, P.O. Box 2211, Victoria, Tex. 77901

Filed Oct. 28, 1983, Ser. No. 546,706

Int. Cl.³ F25C *5/02*

U.S. Cl. 62—320 **13 Claims**



10. An ice cube making machine including at least one ice column forming tube extending vertically and means for forming ice in said tube, said tube having a lower end through which a column of ice will decend, the improvement comprising:

a pair of cutting means disposed below said tube and on the opposite sides thereof,

said cutting means each including an elongate cutting edge facing inwardly toward said decending ice column and extending generally normal to the axis thereof,

said cutting means being mounted for movement of said cutting edges inwardly toward said ice column,

oscillating means connected to said cutting means for simultaneously moving said cutting edges toward and away from each other,

ice column support means positioned below said tube and coupled to said oscillating means for supporting an ice column decending from said tube as said cutting edges move toward each other,

said cutting edges being positioned to engage the opposite side of said supported ice column and in substantially the same plane for cutting an ice cube therefrom,

said column support means being operable by said oscillating means to release said ice cube after said cube has been severed from said column by said cutting means.

4,522,040

REFRIGERATOR

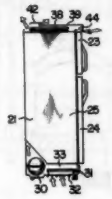
Hideo Ochiai; Yoshinari Nagoya; Ryoichi Fujimoto; Susumu Yamazaki; Nobuhiko Sasamoto, and Shinichi Ishida, all of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,894

Claims priority, application Japan, Sep. 17, 1982, 57-161002

Int. Cl.³ F25D *17/06*

U.S. Cl. 62—419 **2 Claims**



1. A refrigerator comprising an outer frame means for defining a substantially rectangular parallelpiped outer contour of the refrigerator including a ceiling panel, a pair of side panels, a rear panel, and a bottom panel, said ceiling panel, side panels, rear panel, and body panel enclosing at least a refrigerating chamber; a machine chamber disposed at a bottom portion of said outer frame means for accommodating at least a compressor; a cover means disposed flush with a rear surface of said rear panel for covering a rear of said machine chamber; upper heat discharge passage means for discharging heat from at least the machine chamber to an upper part of the refrigerator including tapered grooves provided in both lateral edge portions of said rear panel; said cover means being provided with offset portions on respective lateral sides thereof; lower heat discharge passage means provided in said offset portions of said cover means for enabling a venting of said machine chamber;

heat discharge port means provided in a wall of each of said lower heat discharge passage means for providing a communication between said upper heat discharge passage means and said lower heat discharge passage means; and

wherein an upper end of each of said upper heat discharge passage means is opened to an atmosphere.

4,522,041

ICE-CREAM MAKER

Waldemar Menzel, Kulmbach, Fed. Rep. of Germany, assignor to Firma Ireks Arkady GmbH, Kulmbach, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 102,101

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855910

Int. Cl.³ F25C *7/14*

U.S. Cl. 62—342 **7 Claims**

1. An ice-cream maker, comprising:

a freezing tank provided with a heating system for pasteurizing its contents;

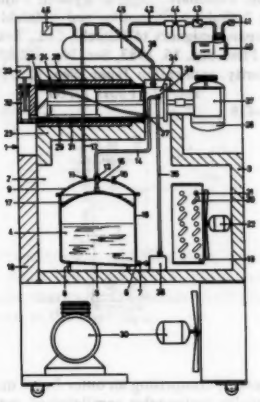
at least one storage container for ice-cream mix which can be cooled and heated;

a forward flow line and a return-flow line coupling said at least one storage container and said freezing tank via at least one interposed supply pump;

distributing means in said at least one storage container for causing ice-cream mix returned thereto via said return-flow line to flow down at least one inside wall of said storage container to form a film, said distributing means comprising a distributing disc, said disc being a separate

unit disposed below the mouth of said return-flow line and not connected to said return-flow line, and said disc leading to said at least one inside wall;

a heating and cooling chamber adapted to be selectively heated and cooled, said at least one storage container



being arranged in said heating and cooling chamber, free on all sides so that it can be washed by air all around, a heating and cooling unit and an air circulating unit being disposed in said heating and cooling chamber, so that the air circulating unit blows either heated or cooled air directly on the storage container.

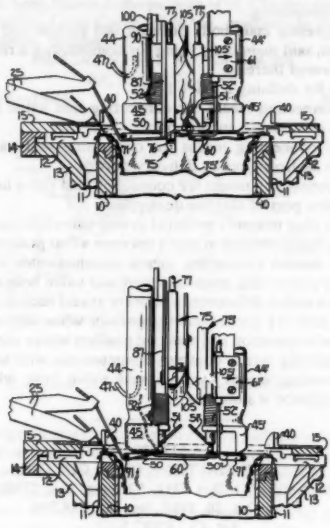
4,522,042

YARN CUTTING AND CLAMPING APPARATUS FOR CIRCULAR KNITTING MACHINES

Arvil Casstevens, Kernersville; William H. Coble; Harper Shields, both of Burlington; Roscoe M. Ferrell, Pittsboro, and Bobby R. Jordan, Burlington, all of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Jul. 18, 1983, Ser. No. 514,511
Int. Cl.³ D04B *15/61*
U.S. Cl. 66—140 S **17 Claims**

1. In a circular knitting machine including a needle cylinder, a circle of needles carried by said needle cylinder, a plurality of yarn feeding stations positioned in spaced-apart relationship around said needle circle, each yarn feeding station having a plurality of yarn feed fingers individually movable between active and inactive positions, and means for knitting yarn fed by said yarn feeding fingers into adjacent solid color fabric pattern areas of different yarn, the combination therewith of means for cutting and clamping yarns moved into and out of active knitting position by said yarn feed fingers, said yarn cutting and clamping means comprising a vertically disposed suction tube having a lower end disposed within said needle circle, a clamping member associated with said lower end of said suction tube, a yarn cutter positioned between said needle circle and said clamping member, guide wire means extending within the needle circle and inwardly of and below the level of the yarn feeding position when the yarn is in active knitting position, a yarn lifting member supported for vertical movement adjacent said clamping member and operatively associated therewith, and operator means operable in response to movement of a yarn feed finger out of active knitting position for lowering said yarn lifting member below the level of said guide wire means and to engage a yarn moved to inactive position and for lifting the same into engagement with said yarn cutter and in close proximity to the lower free end of said suction tube so that the inactive yarn is cut and the free cut end



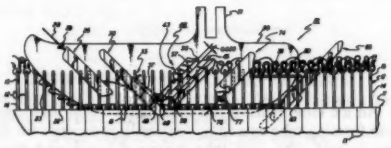
of the inactive yarn is drawn into said suction tube and held by said clamping member associated therewith.

4,522,043

KNITTING MACHINE USING COMBINATION PRESSER RAISING WHEEL

William E. Savage, Manlius, N.Y., assignor to Tompkins Bros. Co. Inc., Syracuse, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,230
Int. Cl.³ D04B *13/00, 15/28, 35/00*
U.S. Cl. 66—80 **3 Claims**



1. In a circular knitting machine having a rotating needle cylinder carrying vertically aligned spring beard needles, apparatus for bringing together a lay-in yarn that passes about the shanks of the needles and a tie yarn which includes

a sinker burr angularly disposed outside the needle circle having blades that mesh with the rotating needles within a yarn threading region, said blades being arranged to pass tie yarn upwardly into open beards moving into the threading region, said burr further including a flat bottom surface that is inclined upwardly to clear the entrance of beards positioned within the threading region,

a pressing wheel having a top surface spaced apart axially from a bottom surface, said pressing wheel being angularly disposed outside the needle circle with the top surface positioned directly beneath the sinker burr, said wheel having a profiled camming surface that extends continuously across the wheel between the top and bottom surfaces which rides in contact with the cleared beards situated in the threading region to close the en-

trance of each beard prior to the tie-yarn being released by the sinker burr blades to prevent the tie-yarn from falling out of the beards,

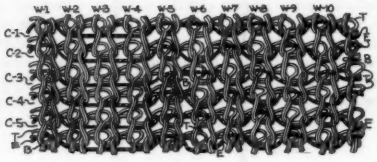
a series of landing blades radially extended from the profiled camming surface of the wheel so that the continuously extended camming surface passes between the blades, said blades meshing with the needles to land lay-in yarn over the closed beard entrances and to cast said lay-in yarn off the needles.

4,522,044

ANKLE AND ARCH SUPPORT SOCK

Roger D. Lineberry, and Harper Shields, both of Burlington, N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Feb. 21, 1984, Ser. No. 581,687
Int. Cl.³ A41B 11/02; D04B 9/46
U.S. Cl. 66—185 **6 Claims**



1. An ankle and arch support sock including a leg portion adapted to cover at least the ankle of the wearer, and a foot portion with a central portion adapted to cover the arch of the wearer, said leg and foot portions being integrally knit of body yarn forming successive courses of wales of stitch loops, and an elastic yarn incorporated in the courses of the body yarn in said ankle and arch portions, said ankle and arch portions having two circumferential sections of different fabric structure characterized by the manner in which the elastic yarn is incorporated therein, one of said sections having a mock-rib fabric structure formed by said elastic yarn being incorporated in spaced-apart wales and floated inside plural wales between said spaced-apart wales, the other of said sections having a diamond pattern fabric structure formed by said elastic yarn being incorporated in alternating wales and floated inside intervening wales of alternating courses and being incorporated in the intervening wales and floated inside the alternating wales of the intervening courses.

4,522,045

PORTABLE SMALL-SIZED WASHING MACHINE

Michiko Harada, 1-62, 3-chome, Suimeidai, Kawanishi-shi, Hyogo, Japan

Filed Aug. 31, 1983, Ser. No. 528,124
Claims priority, application Japan, Sep. 20, 1982, 57-143842[U]
Int. Cl.³ D06F 7/02
U.S. Cl. 68—22 A **2 Claims**

1. A portable washing machine comprising:

a main body,

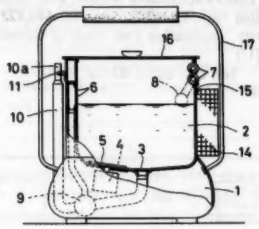
a washing tub mounted on said main body and provided with a bottom and a plurality of side walls,

a drainage opening and a pulsator provided at the bottom of the washing tub,

a wringer provided on one side wall of the washing tub,

an overflow opening provided on another side wall of the washing tub,

a motor means, secured to said main body, for driving said pulsator, and



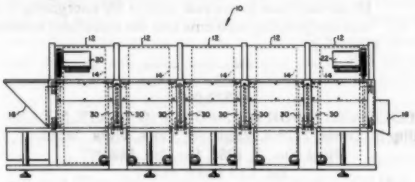
a handle means, attached to the main body, for carrying the washing machine.

4,522,046

CONTINUOUS BATCH LAUNDRY SYSTEM

Adolf E. S. Dreher, Hamburg, Fed. Rep. of Germany, assignor to Washex Machinery Corporation, Tex.

Filed Nov. 3, 1983, Ser. No. 548,477
Int. Cl.³ D06F 31/00
U.S. Cl. 68—27 **18 Claims**



1. A continuous batch laundry system comprising:

a plurality of longitudinally aligned modules having inlet means at one end for receiving articles to be laundered and a discharge means at the other end;

each module including a rotatably supported drum within a housing, said drum being supported for oscillatory and rotary movement about a horizontal axis;

each drum including spaced end walls, each end wall of each drum including a large opening to provide communication between adjacent drums, each drum including means for retaining articles to be laundered during oscillation and for transferring said articles to an adjacent drum during rotation;

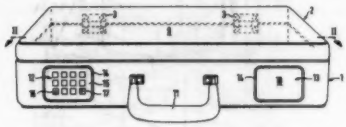
a plurality of flexible couplings for coupling adjacent drums together and for transmission of torque for rotation, one drum with another, said plurality of flexible couplings including means for compensating for angular and parallel misalignment between adjacent drums whereby rotation or oscillation of one drum will cause rotation or oscillation of said adjacent drum despite any misalignment; and

driving means for inducing rotation and oscillation in at least a selected one of said drums.

4,522,047
DOCUMENT CASE

Armin Johl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Seeger Lederwarenfabrik GmbH, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 440,823
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 8136526[U]
Int. Cl.³ E05B 65/52, 47/00
U.S. Cl. 70—69 7 Claims



1. A document case having a concealed locking mechanism comprising

a rectangular box and a lid hinged to the box, each having a reinforcing frame extending around all four sides,

a handle fixed to the box,

an electronically-controlled combination lock assembly having lock elements fixed to the inside of the reinforcing frame of the lid, and cooperating elements fixed to the inside of the reinforcing frame of the box, and

a pair of windows in the reinforcing frame of said box, adjacent said handle,

one of said windows having a keyboard seated within its periphery,

substantially flush with the external surface of said box,

said keyboard having digital selector elements connected to programming switches inside said box for controlling the opening and closing of the cooperating elements of said lock assembly,

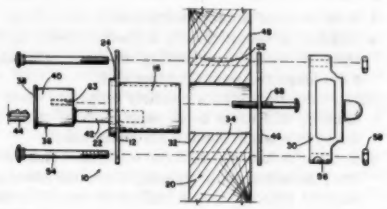
the other of said windows having a battery-charging solar cell unit seated within its periphery, substantially flush with the external surface of said box,

said solar cell unit being connected to a storage battery inside said case to provide power for energizing both said cooperating elements and the electronic controls therefor.

4,522,048
LOCK AND DOOR REINFORCING PLATE MEANS

Phillip N. Davis, 2723 S. Zunis St., Tulsa, Okla. 74114

Filed Nov. 7, 1983, Ser. No. 548,997
Int. Cl.³ E05B 63/00
U.S. Cl. 70—417 7 Claims



1. A lock and reinforcing plate device for a door and comprising first and second plate means adapted to be disposed against the opposite faces of the door in substantial mutual alignment, tube means rigidly secured to the inner face of the first plate means and extending through the door in a direction toward the second plate means, an aperture provided in the first plate means in substantial axial alignment with the tube means, ring means rigidly secured to the outer face of the first plate means and concentrically arranged with respect to the tube means, lock cylinder means disposed against the outer face of the first plate means and extending into the interior of the tube means in a direction toward the second plate means, connection means extending through the second plate means and tube means for engagement with the lock cylinder means for securing the lock cylinder means in position, lock assembly means disposed adjacent the outer face of the second plate means, and in operable engagement with the lock cylinder means and securing means extending between the first and second plate means and through the door and lock assembly means for securing the device on the door.

4,522,049
ALUMINUM ALLOY FOOD CAN BODY AND METHOD FOR MAKING SAME

Ernest J. Clowes, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 14, 1983, Ser. No. 475,164
Int. Cl.³ B21B 45/00
U.S. Cl. 72—46 9 Claims

1. A method for making an aluminum alloy food can body having a flanged open end for sealing with a can end by double seaming, comprising the steps of:

blanking and forming at least one cylindrical cup from an uncoated aluminum alloy sheet, said cup having a side wall, an open end, and a bottom end wall;

reforming said cup at least once to lengthen the side wall and reduce the diameter thereof, and concurrent therewith, ironing a portion of the cup side wall adjacent the open end thereof to thin said portion to a thickness less than the thickness of the side wall portion extending from the ironed portion to the bottom end wall, said ironed portion including at least the portion to be flanged;

forming a pressure resistant profile in the bottom end wall of said cup;

trimming a portion of the ironed portion adjacent the open end of the reformed cup to provide a can body of predetermined length with a uniform edge on the side wall defining the open end;

outwardly flanging a portion of the side wall adjacent the open end of said trimmed can body;

forming a plurality of annular beads in a central, intermediate portion of the side wall of said can body; and

coating at least the interior surface of said can body with a material suitable for contacting a product to be packaged in said can body.

4,522,050
THREE STAND MINI MILL METHOD AND APPARATUS

John E. Thomas, Pittsburgh, Pa., assignor to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Jan. 14, 1983, Ser. No. 458,041
Int. Cl.³ B21B 1/06
U.S. Cl. 72—229 2 Claims

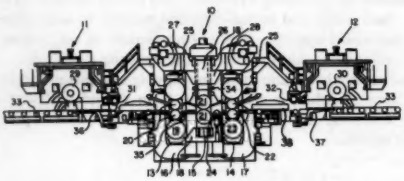
1. A mini hot strip mill for reducing slabs to a strip product comprising:

A. an integrally formed three stand mill including a first and

second four high finishing mill, each retained in a mill housing, and a two high roughing mill positioned between said first and second mills and retained in supports connecting the two mill housings;

B. a pair of coiling furnaces, one positioned upstream of said mill and the other positioned downstream of said mill; and

C. a first and second motor connected through a gear box to said mill for driving said finishing mills independently and in speed matched relationship and for jointly driving said roughing mill



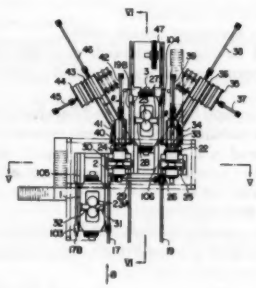
whereby a slab is initially reduced to an intermediate workpiece by the roughing mill as it freely passes through the finishing mills which are maintained open in a roughing mode, said intermediate workpiece being reduced from the intermediate workpiece to the strip product on the two finishing mills while the roughing mill is maintained open and during processing said slab being coiled and decoiled in said coiler furnaces when the slab is at a thickness capable of being coiled.

4,522,051

CONTINUOUS ROLLING MILL

Masahiro Hayashi, Hitachi; Makoto Shimizu; Kazuo Kobayashi, both of Ibaraki, and Teruo Sekiya, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 16, 1983, Ser. No. 494,705
Claims priority, application Japan, May 17, 1982, 57-81384
Int. Cl.³ B21B *13/08, 31/08*
U.S. Cl. 72—235 **16 Claims**



1. A continuous rolling mill, comprising:

horizontal roll stands and vertical roll stands disposed alternatingly along a rolling line;

rolling guides aligned between the work rolls of adjacent roll stands;

a frame supporting said roll stands;

rails transverse to the rolling line supporting said frame operatively to be movable in the direction crossing the rolling line to a first exchanging position together with said roll stands and said rolling guides;

at least some of said roll stands being mounted for movement relative to said frame in respective stand extracting directions;

rails respectively adjacent said some roll stands in alignment with said stand extracting directions when said frame is in said first exchanging position;

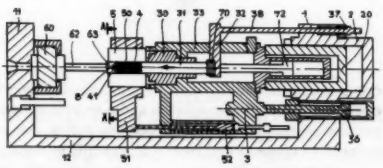
offsetting means for moving said some of the roll stands relative to said frame along their rails, away from the other roll stands, and from said first exchanging position to a second exchanging position where the rolling lines of the horizontal roll stands and the vertical roll stands are offset from each other so that the offset provides sufficient room that rolls may be extracted and exchanged from all the roll stands.

4,522,052

PROCESSES AND DEVICES FOR THE DRAWING OF TUBES BY EXTRUSION

Michel Doudet, Epone, France, assignor to Clecim, Courbevoie, France

Filed Jul. 1, 1983, Ser. No. 510,096
Claims priority, application France, Jul. 1, 1982, 82 11573
Int. Cl.³ B21C *27/00, 35/06*
U.S. Cl. 72—265 **6 Claims**



1. Process for drawing tubes along a drawing axis (10) by extrusion of a metal billet (4) placed in a cylindrical receptacle (50) forming a container (5), including the steps of

(a) ramming said billet (4) within said receptacle (50) by pushing said billet against a ramming insert (63) closing said receptacle forming a boss (41) on the face of said billet (4) opposite said ramming insert (63), said boss (41) being inscribed within an orifice (66) of said die and having a plane face centered on an axis angularly diverging from said drawing axis (10), said ramming insert (63) being provided for this purpose with an impression (8) in the form of a circular dish with a flat bottom which has recessed the desired shape;

(b) perforating said billet (4) by means of an axial mandrel (7) whose advance is blocked before it reaches said bottom of said dish (8) so that it does not perforate said boss (41);

(c) replacing said ramming insert (63) in the axis of said receptacle (50) by an insert (65) holding a die (66);

(d) said mandrel (7) having a diameter smaller than that of said die and advancing into the latter;

(e) detaching said boss (41) without carrying along the bottom of said die (66), which remains attached to said billet (4) by one edge because of its offset in relation to said mandrel (7).

4,522,053

ELECTRICAL CONNECTOR PROGRAMMING TOOL

Richard W. Petersen, Taunton; John M. Pierini, South Attleboro, both of Mass., and Herbert G. Yeo, Port Charlotte, Fla., assignors to Augat Inc., Attleboro, Mass.

Filed Dec. 6, 1982, Ser. No. 447,301
Int. Cl.³ B21D *5/04, 53/36*
U.S. Cl. 720—316 **8 Claims**

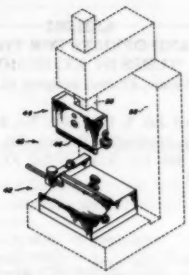
1. An electrical connector programming tool for programming an electrical connector for a flat ribbon cable of the type having a bus bar having a plurality of contacts to be programmed that are each normally in an electrically operative upstanding condition, comprising:

a tray subassembly for removably retaining the electrical

connector in an orientation where individual ones of the plurality of upstanding contacts are exposed;

a head subsembly having a like plurality of tongues individually corresponding to an associated one of the exposed upstanding contacts for impacting said contacts;

means coupled to said head and to said like plurality of tongues for individually mounting each of said tongues for motion relative to said head between a first preselected position selected to not-impact but allow a corresponding



one of the upstanding contacts to remain in the electrically operative upstanding condition and a second preselected position selected to impact a corresponding one of the upstanding contacts and bend it at an angle inclined to the angle of its upstanding condition to an electrically inoperative condition; and

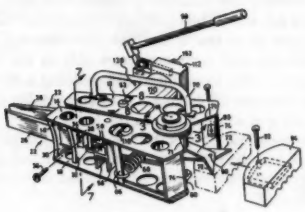
means, coupled to said tongues and to said head subassembly for releasably locking said tongues individually in a selected one of said first and second positions.

4,522,054

EMERGENCY RESCUE APPARATUS

Randall J. Wilson, and Bruce C. Wilson, both of Don Mills, Canada, assignors to Power Pry Corporation, Don Mills, Canada

Filed Sep. 26, 1983, Ser. No. 535,806
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—392 **13 Claims**



1. Access or rescue tool comprising:

a pair of arms pivotally connected together adjacent one end of each of such arms,

whereby the opposed ends are free,

each arm comprising a pair of members spaced in the direction of the connection pivotal axis,

each such pair of members being joined by a plurality of bridging members to form a rigid framework,

a hydraulic piston cylinder having a piston contained therein, a piston rod attached to said piston and projecting from one end of said cylinder,

said piston cylinder being pivotally connected to one of said arms intermediate its connected and its free end,

said piston rod being pivotally connected to the other of said arms intermediate its connection and its free end,

said cylinder and piston rod pivotal connection being substantially parallel to the arm pivotal connection,

said piston cylinder and said piston rod being pivotally attached to said arms so that the piston rod and the axis of said cylinder extend between the spaced members forming each of said arms,

means for mounting a tool on the free end of at least one of said arms,

means for providing hydraulic fluid to said cylinder to move said piston rod in one direction relative to said cylinder,

and means operable to allow movement of said piston rod relative to said cylinder in the opposite direction,

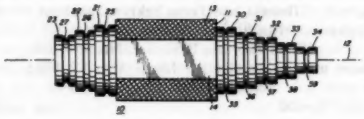
wherein a hydraulic pump for moving said piston rod in said one direction is arranged to form a rigid unit with said cylinder, said hydraulic pump having manual operating means.

4,522,055

BENDING TOOL

Eric V. Berger, Brookline, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 2, 1983, Ser. No. 548,257
Int. Cl.³ B21D *31/00*
U.S. Cl. 72—477 **4 Claims**



1. As an article of manufacture,

a mandrel for semi-rigid coaxial cables,

said mandrel having an enlarged, generally cylindrically shaped support portion, said mandrel extending along a linear axis,

said support portion having opposed flats formed thereon to provide for stability in the event said support portion were to be secured in a vise, and said support portion being formed with a knurled surface about its cylindrical periphery to provide for stability in the event said support portion were to be hand held,

said mandrel including a first series of superimposed cylindrical portions of gradually diminishing diameters along a first direction along said axis,

said mandrel including a second series of superimposed cylindrical portions of gradually diminishing diameters along a second direction along said axis, said second direction being opposite to said first direction,

each of said cylindrical portions being formed with a circumferential groove,

each said groove of said first series having a like width and a like depth as another groove of said first series, and

each said groove of said second series having a like width and a like depth as another groove of said second series,

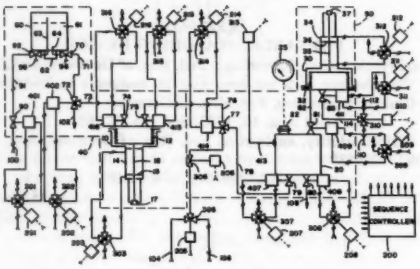
wherein said like width of each said groove of said first series is not equal to said like width of each said groove of said second series, and

wherein said like depth of each said groove of said first series is not equal to said like depth of each said groove of said second series.

4,522,056
METHOD AND APPARATUS FOR MEASURING REID VAPOR PRESSURE

Thomas G. Chin, and Arthur Alston, both of El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 26, 1983, Ser. No. 526,737
Int. Cl.³ G01N *7/16*
U.S. Cl. 73—64.2 **15 Claims**

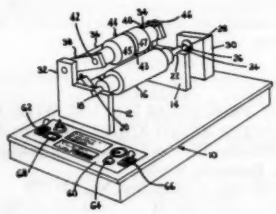


1. An apparatus for measuring the Reid Vapor Pressure of a liquid hydrocarbon material comprising:
first compartment maintained at a substantially fixed temperature about the range of 32° F. to 40° F.;
a second compartment maintained at a substantially fixed temperature of about 100° F.;
means, within said first compartment, for providing a sample of the liquid hydrocarbon material;
a sample chamber within said first compartment;
first means for connecting said means for providing a sample and said sample chamber;
a measuring chamber within said second compartment;
second means for connecting said sample chamber and said measuring chamber;
an expansion chamber within said second compartment;
third means for connecting said measuring chamber and said expansion chamber;
means, associated with said measuring chamber, for measuring pressure; and
means, coupled to said means for measuring pressure for providing an output indicative of the vapor pressure of a sample of the liquid hydrocarbon material.

4,522,057
PRINTING INK PROOFER

Roman R. Kerchiss, Royton, United Kingdom, assignor to RK Chemical Company Limited, England

Filed Oct. 26, 1983, Ser. No. 545,456
Int. Cl.³ G01N *33/32*
U.S. Cl. 73—150 R **20 Claims**

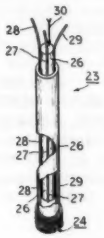


1. A method of preparing a proof or sample of an ink (as herein defined) to enable its colour and coating capability to be determined as a preliminary to the ink being employed in a printing or coating process, comprising the steps of:
(1) applying a quantity of ink to a resiliently deformable first roller;
(2) bringing the first roller into rolling contact with a second roller which is engraved with microscopic ink-trapping depressions;
(3) causing the ink on the first roller to be applied to the engraved second roller, using a doctor blade set to wipe clean the engraved roller surface and leave the ink only in depressions;
(4) controlling the pressure between the first and second rollers so that ink is transferred from the depressions onto the surface of the first roller until equilibrium is reached;
(5) introducing into the nip between the first and second rollers a sample of sheet material is equivalent to that to which the ink is to be applied in a subsequent printing process and causing the ink on the surface of the resiliently deformable first roller to be applied as a coating to the said sheet material.

4,522,058
LAMINAR-FLOW CHANNELING IN THERMAL FLOWMETERS AND THE LIKE

James H. Ewing, Brockton, Mass., assignor to MKS Instruments, Inc., Burlington, Mass.

Filed Jun. 15, 1983, Ser. No. 504,530
Int. Cl.³ G01F *5/00*
U.S. Cl. 73—202 **5 Claims**

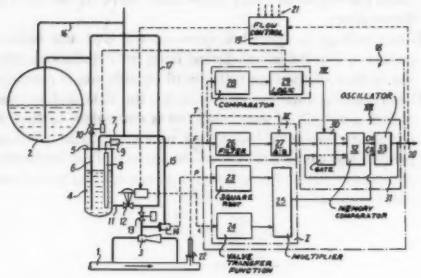


1. In combination with a flowmeter having a main fluid flow path extending through a base and a flowmetering sensor associated with a laminar-flow path in shunt relation to a relatively short path of the main flow path, means for establishing laminar-flow conditions in the shunted part of the main fluid flow path, comprising a substantially straight tubular member disposed to fit within said shunted part of the main flow path, a plurality of elongated straight structural elements clustered together within said tubular member in a self-holding mechanically fitted relationship therewith and with one another which leaves a plurality of substantially straight and relatively small fluid flow channels therethrough, said elongated structural elements including a core member coaxial and substantially coextensive with said tubular member and further including a plurality of wire-form members fitted between said core member and tubular member to produce said relatively small fluid flow channels in separated spaces therebetween, said channels all having effective length-to-diameter ratios which promote laminar flow and extending substantially fully the length of said tubular member, and means for removably fastening the assembly of said tubular member and said elongated elements as a unit within said shunted part of the main fluid flow path.

4,522,059
FLOWMETER AND INSTALLATION FOR MIXING AN ADDITIVE IN A LIQUID

Christian Rodde, Palaiseau, and Jean Desarnaud, Vanves, both of France, assignors to Octel S.A., Paris, France

Filed Feb. 2, 1983, Ser. No. 463,250
Claims priority, application France, Feb. 3, 1982, 82 01708
Int. Cl.³ G01F *3/24*
U.S. Cl. 73—223 13 Claims

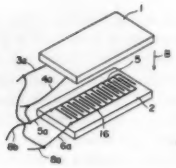


1. A flowmeter having a tank disposed between a discharge circuit in which the rate of flow is to be measured and a supply circuit from which the tank is refilled when the liquid level in the tank falls below a predetermined value, and a plunger suspended in the tank via a force sensor providing an output signal indicative of flow from the tank to the discharge circuit, means independent of the tank and the plunger to continuously supply a signal which is approximately representative of the rate of flow in the discharge circuit, and means responsive to said output signal of the force sensor outside of refilling cycles of the tank for calibrating said means independent of the tank and the plunger, so that reasonably accurate flow measurement is obtained during a refilling cycle of the tank.

4,522,060
DRY/DEW/FROST SENSOR

Michihiro Murata, Kyoto, and Shoichi Kitao, Otokuni, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 21, 1983, Ser. No. 477,410
Claims priority, application Japan, Mar. 24, 1982, 57-48415
Int. Cl.³ G01N *27/30;* G01W *1/00*
U.S. Cl. 73—336.5 7 Claims

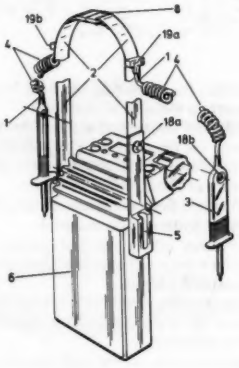


1. A dry/dew/frost sensor, comprising:
(A) a first sensor unit including:
(1) a first ceramic substrate having a permittivity which is less than the permittivity of ice; and
(2) a first pair of electrodes formed on a first surface of said first ceramic substrate and being electrically insulated and spaced apart from one another in a predetermined pattern;
(B) a second sensor unit including:
(1) a second ceramic substrate having a permittivity which is less than the permittivity of ice; and
(2) a second pair of electrodes formed on a first surface of said second ceramic substrate and being electrically insulated and spaced apart from one another in a pattern similar to said predetermined pattern; and
(C) means for mounting said first and second substrate with said first surfaces of said substrate and said first and second pairs of electrodes facing each other and being spaced insulatively apart from one another so as to define a predetermined open space between said first surfaces of said substrates, whereby the impedance of said sensor will change to different values when in a dry state, a frosted state and a bedewed state.

4,522,061
PORTABLE MEASURING DEVICE

Karl Hochreuther, Nuremberg, Fed. Rep. of Germany, and Jörg Tragatschnig, Zell am See, Austria, assignors to Metrawatt GmbH, Nuremberg, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 522,055
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229689
Int. Cl.³ G01D *11/24, 11/30*
U.S. Cl. 73—431 13 Claims



1. Portable measuring device, comprising a measuring instrument, a carrying strap fastened to said measuring instrument for hanging said measuring instrument around the neck, measuring lines electrically connected to said measuring instrument and passing through at least part of said carrying strap, measuring probes connected to said measuring lines, said measuring lines being in the form of flexible spiral cables connected from said carrying strap to said measuring probes, and at least one mounting disposed on said measuring instrument for fastening unused measuring probes hanging on said measuring lines, said carrying strap having two ends fastened to said measuring instrument, said measuring lines being electrically connected to said measuring instrument in vicinity of at least one of said ends of said carrying strap, and said measuring lines emerging from said carrying strap substantially at shoulder height and each hanging down at a respective side of of said measuring instrument and leading to a respective one of said measuring probes.

4,522,062
DIGITAL PROCESSOR FOR USE WITH AN ACCELEROMETER BASED ANGULAR RATE SENSOR

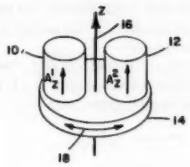
Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Sep. 2, 1983, Ser. No. 528,775
Int. Cl.³ G01C *23/00, 19/56;* G01P *15/08*
U.S. Cl. 73—505 17 Claims

5. A circuit for deriving from a pair of accelerometers which are being vibrated in a direction substantially normal to their

force sensing axes at a frequency ω an angular rate signal representing the angular rate of rotation of the accelerometers, comprising:

sign switching means operatively connected to the accelerometers for multiplying the acceleration signals from the accelerometers by a zero mean periodic function of ω;



first conversion means operatively connected to said sign switching means for converting said multiplied acceleration signals to a first frequency signal; and

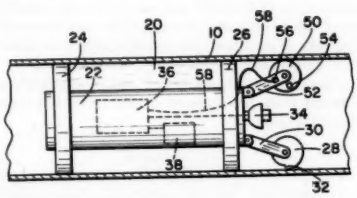
first counter means operatively connected to said first conversion means for generating from said first frequency signal a digital angular rate signal representing the rate of rotation of the accelerometers.

4,522,063

METHODS AND APPARATUS FOR INDICATING SELECTED PHYSICAL PARAMETERS IN A PIPELINE

Burton Ver Nooy, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Sep. 16, 1983, Ser. No. 532,753
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—579 **22 Claims**



1. A method of detecting selected physical parameters in a pipeline comprising the steps of:

traversing the interior of the pipeline by an instrumentation apparatus;

introducing a sequence of sound signals into the pipeline while traversing the said pipeline;

receiving sound signals from within the pipeline occurring as a consequence of the vibration of the pipeline in response to said introduced sound signals; and

determining physical parameters of the pipeline by analysis of characteristics of the received signals.

4,522,064

ULTRASONIC METHOD AND APPARATUS FOR DETERMINING THE DEPTH OF A CRACK IN A SOLID MATERIAL

John D. McMillan, Kennewick, Wash., assignor to Sigma Research Inc., Richland, Wash.

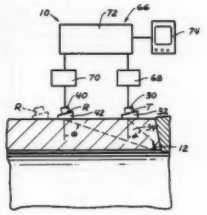
Filed Dec. 12, 1983, Ser. No. 560,752
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—592 **9 Claims**

1. In a method for ultrasonic inspection of solid material of predetermined configuration to determine the depth of a crack therein,

placing a first ultrasonic transducer acoustically coupled with a surface of the solid material;

placing a second ultrasonic transducer in acoustical coupling with the surface of the solid material spaced from the first ultrasonic transducer;

generating an ultrasonic pulse of a selected frequency into the solid material from one of the ultrasonic transducers to acoustically illuminate the crack and produce an acoustical wave form reflected from the crack;



receiving the reflected acoustical wave form at the other ultrasonic transducer and generating an electrical signal, the magnitude of which corresponds to the magnitude of the reflected acoustical wave form;

moving at least one of the ultrasonic transducers relative to the other ultrasonic transducer and relative to the crack to vary the magnitude of the electrical signal; and

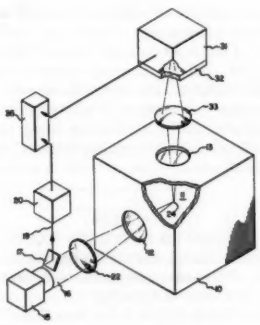
determining the distance between the ultrasonic transducers wherein the magnitude of the electrical signal is at a maximum.

4,522,065

REMOTE PRESSURE SENSOR

John C. Devins, Burnt Hills, and Amandus H. Sharbaugh, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,780
Int. Cl.³ G01L *9/00*
U.S. Cl. 73—705 **7 Claims**



1. Apparatus for measuring the pressure of a gas within an enclosure comprising:

(a) means for generating a beam of light,

(b) means for focusing said beam at a preselected point within said enclosure,

(c) means for varying the intensity of said beam to cause electrical breakdown of the gas at a preselected point, and

(d) detector means for measuring the intensity of said beam at which said electrical breakdown occurs.

4,522,066

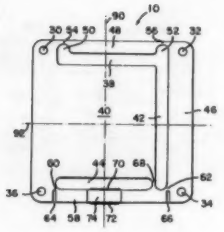
TEMPERATURE-COMPENSATED EXTENSOMETER

Walter P. Kistler, and Martin D. China, both of King County, Wash., assignors to Kistler-Morse Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 377,819, May 13, 1982, abandoned. This application May 25, 1983, Ser. No. 498,042

Int. Cl.³ G01B 7/18

U.S. Cl. 73—781 **38 Claims**



24. A system for measuring the load-induced strain along a measurement axis in a load-bearing structure while being insensitive to isotropic strains in said structure, said system comprising an extensometer mounted on said structure through two mounting bases, with said bases being mechanically coupled to a single measurement beam in a manner causing said beam to deflect in one direction responsive to a load-induced strain of one polarity applied between said bases along said measurement axis and causing said beam to deflect in the opposite direction responsive to a load-induced strain of said one polarity applied between said bases along an axis that is orthogonal to said measurement axis, and in a manner causing no deflection in said measurement beam responsive to isotropic stress in said structure, such that said measurement beam deflects responsive to load-induced strains but is unaffected by isotropic strains.

32. A method of measuring the magnitude of a load applied to a load-bearing structure along a measurement axis which is substantially insensitive to isotropic strains in said structure, said method comprising mounting an extensometer on said structure, said extensometer having an output that is proportional to the magnitude of relative movement between a pair of mounting bases along an axis of sensitivity, each of said mounting bases being mounted on said structure through at least one mounting point, with all mounting points on each base being symmetrically located with respect to an axis of symmetry of said extensometer extending generally perpendicularly to said axis of sensitivity, said extensometer being mounted on said structure with said axis of sensitivity intersecting said measurement axis at 45°.

4,522,067

THIN-FILM STRAIN GAUGE

Kurt Burger, Friolzheim, and Heiko Gruner, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE81/00228, § 371 Date Sep. 17, 1982, § 102(e) Date Sep. 17, 1982, PCT Pub. No. WO82/03458, PCT Pub. Date Oct. 14, 1982

PCT Filed Dec. 18, 1981, Ser. No. 420,258

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113745

Int. Cl.³ G01L 1/22, 9/04; H01C 17/12

U.S. Cl. 73—862.65 **15 Claims**

1. A temperature-compensated thin-film strain gauge, particularly a precision thin-film strain gauge capable of integration into a thin-film circuit, for measuring force, pressure, displacement, weight, or acceleration, having

an elastically deformable spring device (**10, S**) in combination with

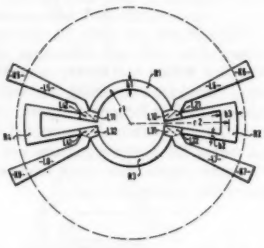
at least one elongation-sensitive resistor element, having at least one deflectable resistance region (**R1, R3**) and one substantially non-deflecting resistance region (**R2, R4**);

at least one low-impedance connection element (**L11–L42**) connecting at least said resistance regions (**R1, R3; R2, R4**); and

connection tracks (**L5–L8**), wherein, to simplify production and facilitate integration of the gauge in a larger thin-film circuit, at least one of:

the resistor element disposition (**R1, R4**);

the low-impedance connections (**L11–L42**) between the various resistance regions; and



associated connection tracks (**L5–L8**) are applied by means of at least one of thermal vapor deposition and cathode sputtering; and wherein, to prevent temperature fluctuations from giving rise to erroneous strain change measurements, the temperature coefficients of resistance (TCR's) of the materials used for the elongation-sensitive resistor element (**R1–R4**) and at least one of the low-impedance connections (**L11–L42**) and the connection tracks (**L5–l8**) are of the same order of magnitude; and wherein, to prevent loss of measurement signal strength, at least one of:

the low-impedance connections (**L11–L42**); and

the connection tracks (**L5–L8**) are of material which is different from the material of the resistance element regions (**R1–R4**).

4,522,068

ULTRASONIC DENSITOMETER FOR LIQUID SLURRIES

George E. Smith, Missouri City, Tex., assignor to Electro-Flow Controls, Inc., Missouri City, Tex.

Filed Nov. 21, 1983, Ser. No. 553,585

Int. Cl.³ G01N 9/24

U.S. Cl. 73—32 A **4 Claims**

1. A method for directly measuring the density of a mixture of a fluid and a solid of fine, suspended particles of known character, comprising,

isolating a quantity of the fluid between a transmit transducer and a receive transducer separated by a predetermined distance,

driving said transmit transducer with pulses at a predetermined frequency,

receiving said pulses by said receive transducer following the acoustic time of transmission through said isolated fluid,

producing a latching/unlatching output signal having a leading edge occurring with each produced pulse supplied to said transmit transducer and a trailing edge occurring with each received pulse received by said receive transducer,

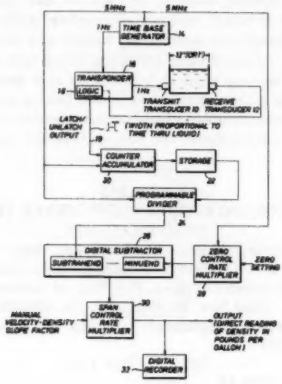
accumulating a count from a high frequency standard signal during the period between said leading edge occurrence and said trailing edge occurrence,

storing said accumulated count,

dividing said stored count by a number of proportional to a

measurement conversion standard to produce a high frequency velocity signal,

subtracting a fixed high frequency signal from said high frequency velocity signal, said fixed high frequency signal representing a frequency corresponding to the lowest



expected fluid density, to produce a subtraction frequency corresponding to a fluid density velocity below the velocity for the lowest fluid density, and

multiplying said subtraction frequency with an empirically determined span factor to produce an output in density units of measurement.

4,522,069

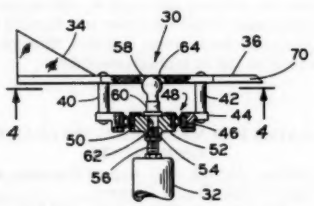
WINDVANE

Samuel Birnbaum, 11 Shadow Grove La., Holbrook, N.Y. 11741

Filed Jan. 12, 1981, Ser. No. 224,460

Int. Cl.³ G01P *13/02*

U.S. Cl. 73—188 **2 Claims**



1. A windvane adapted to be illuminated at night incident to indicating wind direction comprising, in combination, a sailboat mast, a battery-operated light mounted on top of said mast, a plastic light-transmitting windvane having an internal opening receiving said light therein mounted for rotation about said light, and light-releasing beveled edges provided about the peripheral edge of said windvane, whereby light rays impinging upon said windvane are released therefrom through said beveled edges to thereby illuminate said edges and provide a visual indication of the direction of the wind that is providing the position of rotation to said windvane.

4,522,070

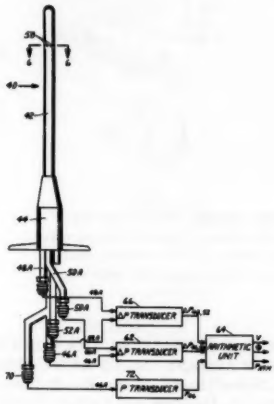
METHOD AND APPARATUS FOR CORRECTING BAROMETRIC PRESSURE FOR WIND VELOCITY AND DIRECTION

Floyd W. Hagen, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 30, 1983, Ser. No. 537,642

Int. Cl.³ G01L *7/00*

U.S. Cl. 73—384 **12 Claims**



1. A sensing instrument for sensing atmospheric pressure of a fluid medium comprising enclosure means having a shape exposed to the fluid medium, which fluid medium has a certain density is moving at a certain velocity relative to the sensing instrument, which velocity is determined by an external source, the enclosure means providing an internal chamber, the sensing instrument having at least one sensing port means having a preselected shape open to the fluid medium and to the internal chamber for sensing a measured pressure of the fluid medium, the chamber being closed to prevent fluid flow of the fluid being sensed therethrough, such measured pressure being corrected for the effects of the velocity of the fluid medium according to the formula

$$P_{ATM}=P_M+K\,V^2$$

where P_{ATM} is atmospheric pressure, P_M is measured pressure in the chamber of the enclosure means, K is a constant that is a function of the shape of the enclosure means, the shape and number of the port means and the density of the fluid medium, and V is the velocity of the fluid medium and is supplied from the outside source.

4,522,071

METHOD AND APPARATUS FOR MEASURING STRESS

R. Bruce Thompson, Ames, Iowa, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1983, Ser. No. 518,243

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—597 **12 Claims**

1. A method of determining stress in an object comprising:

generating a first horizontally polarized ultrasonic shear wave through said object, said first wave having a known direction of propagation parallel to the surface of said object,

determining the velocity of said first wave,

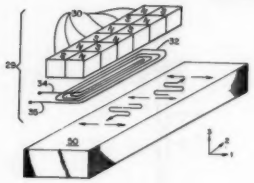
generating a second horizontally polarized ultrasonic shear wave through said object, the direction of propagation

and polarization of said second wave being interchanged with those of said first wave,

determining the velocity of said second wave, and

determining the stress in said object according to the formula:

$$\rho(V_{12}^2 - V_{21}^2) = T_1 - T_2$$



where

V_{12} = the velocity of said first wave

V_{21} = the velocity of said second wave

ρ = the density of the material, and

$T_1 - T_2$ = the stress of the material.

4,522,072

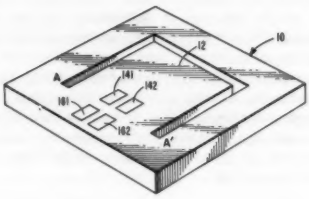
ELECTROMECHANICAL TRANSDUCER STRAIN SENSOR ARRANGEMENT AND CONSTRUCTION

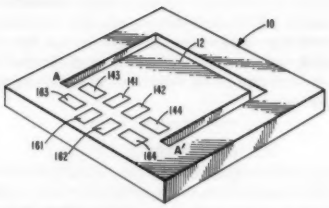
Robert E. Sulouff; Sam S. Hartin; Koy B. Cook; David V. Kerns, Jr.; Jimmy L. Davidson, and Keith O. Warren, all of Auburn, Ala., assignors to Insouth Microsystems, Inc., Auburn, Ala.

Filed Apr. 22, 1983, Ser. No. 487,731

Int. Cl.³ G01L *1/18*

U.S. Cl. 73—765 **43 Claims**





1. In an electromechanical transducer having a main body and flexing means attached to said main body for flexing in response to an external stimulus applied to said transducer, strain sensing means responsive to flexion of said flexing means for providing an output signal representative of the external stimulus, said strain sensing means comprising:

a first piezoresistive voltage divider connected across a first source of electrical power, said first piezoresistive voltage divider comprising in series a piezoresistive strain sensing element coupled to said flexing means, an output terminal, and a piezoresistive strain sensing element coupled to said main body, said first piezoresistive voltage divider providing across said piezoresistive strain sensing element coupled to said main body a voltage representing non-strain effects in said main body;

a second piezoresistive voltage divider connected across a second source of electrical power, said second piezoresistive voltage divider comprising in series a piezoresistive strain sensing element coupled to said main body, an output terminal, and a piezoresistive strain sensing element coupled to said flexing means, said second piezoresistive voltage divider providing across said piezoresistive strain sensing element coupled to said flexing means a voltage representing strain in said flexing means; and

output means coupled to said output terminals for providing, as the output signal, the voltage between said terminals.

4,522,073

MAGNETIC-INDUCTIVE FLOW METER FOR HIGH TEMPERATURES

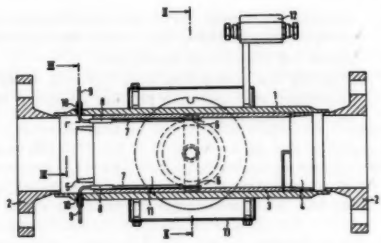
Joachim Knaak, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to INTERATOM Internationale Atomreaktorbau GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,628

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244473

Int. Cl.³ G01F *1/58*

U.S. Cl. 73—861.12 **3 Claims**



1. Magnetic-inductive flow meter, comprising a pipe section for carrying fluid flowing in a given direction, insulation in the form of a ceramic tube disposed loosely inside of said pipe section, magnet coils disposed on the outside of said pipe section for producing a magnetic field in said pipe section perpendicular to the given flow direction, at least two electrodes disposed inside said pipe, holding pieces wedged against said ceramic tube for securing said ceramic tube against rotation, and leads connected to said electrodes and disposed inside said ceramic tube, said leads being extended through said pipe section beyond an end of said ceramic tube.

4,522,074

APPARATUS FOR MEASURING SEVERAL FORCE COMPONENTS

Hans W. Häfner, Aichach, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,514

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144358

Int. Cl.³ G01L *5/16*; G01M *9/00*

U.S. Cl. 73—862.04 **10 Claims**

1. An apparatus for measuring a plurality of force components such as those based on forces of a flowing medium which act on an object of measurement comprising in combination:

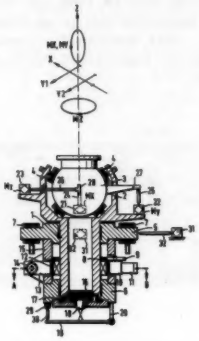
an object carrier;

frictionless bearings;

a cylinder supporting, in said frictionless bearings, the object carrier in a mobile fashion about pivotal, rotational, horizontal and vertical axes;

a support means guiding said cylinder about the vertical axis for rotational and longitudinal movement;

force measuring devices for the force components to be measured, said force measuring devices connected to the object carrier and connected to and carried by the cylinder; and



a rotary drive connected to said cylinder for setting the object carrier, by rotating the cylinder, into a desired angular position in respect of the support means;

whereby the object of measurement maintains its position relative to the force measuring devices.

4,522,075

TORQUE WRENCH

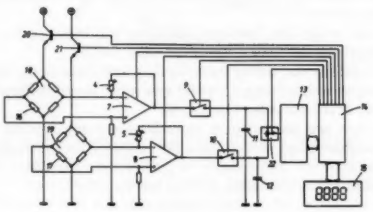
Peter Pohl, Eichenstrasse, D 4006 Erkrath 2, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,074

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228086

Int. Cl.³ B25B *23/142*

U.S. Cl. 73—862.23 **19 Claims**



9. A torque wrench with an elongate deflection beam, a pair of independent strain gauges attached to a side of the beam which is stretched and compressed during normal use of the wrench, the strain gauges are spaced longitudinally of the beam and relative to each other, each strain gauge is a resistor connected in a related measuring bridge, the output of each bridge is conducted to an amplifier, the amplified voltage of each amplifier is conducted through a related switch and stored in a related measured voltage value memory, the stored voltages in the two memories are conducted to a switching means and cyclically and alternatingly conducted to an analog-to-digital converter and thence from the analog-to-digital converter to a micro-processor which compares the voltages and conducts a signal to an indicating instrument.

4,522,076

METHOD OF COLLECTING SAMPLES FROM MATERIAL ON A BELT CONVEYOR

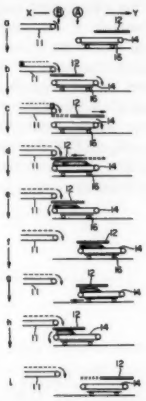
Hiroshi Shimokawa, Kitakyushu, Japan, assignor to Kabushiki Kaisha Imamura Seisakusho, Kitaminato, Japan

Filed Oct. 24, 1983, Ser. No. 544,981

Claims priority, application Japan, Oct. 27, 1982, 57-187350

Int. Cl.³ G01N *1/20*

U.S. Cl. 73—863.41 **5 Claims**



1. A method of collecting samples from a material on a belt conveyor comprising the steps of advancing a baffle member to a position beneath the delivery end of an upstream main belt conveyor continuously conveying a material, advancing a collecting belt conveyor to a position beneath said baffle member, retracting said baffle member to permit transfer of a portion of the material from said main belt conveyor onto said collecting belt conveyor running in the same direction as that of said main belt conveyor at the same speed as that of said main belt conveyor, advancing said baffle member to the position beneath said delivery end of said main belt conveyor again to terminate the transfer of the material from said main belt conveyor onto said collecting belt conveyor, stopping the operation of said collecting belt conveyor at the same time, and then running said collecting belt conveyor at low speed to collect as a sample a portion of the mass of the material transferred onto said collecting belt conveyor.

4,522,077

FLOW MEASURING SYSTEM INCLUDING A VENTURI

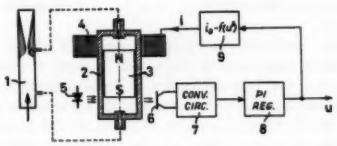
Karl Köberle, Panoramastrasse 14, D-7980 Ravensburg 19, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,400

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224285

Int. Cl.³ G01P *5/14*

U.S. Cl. 73—861.63 **9 Claims**



1. A fluid flow measuring system comprising: a venturi connected to conduct the fluid whose flow is to be measured and having two outlet ports between which a pressure differ-

ential proportional to such fluid flow is created; a movably mounted measuring element having a selected zero position and connected to said venturi to be subjected to a displacement force corresponding to the pressure differential; transducer means associated with said measuring element for producing an electrical signal representative of the displacement of said measuring element from its zero position; a regulating device having a signal input connected to receive said electrical signal, and a signal output, and presenting a transfer characteristic having an integrating component such that the signal at said output is representative of the magnitude and duration of displacement of said measuring element from its zero position; signal squaring means connected to said regulating device for generating a control signal dependent on the square of the signal at said output of said regulating device; and a hysteresis-free electromagnetic system connected to apply to said measuring element, in response to the control signal, a magnetic displacement force of a magnitude and direction to cause said measuring element to reach its zero position.

4,522,078

DEVICE FOR ADJUSTING HEIGHT OF CUSHION IN REAR PART OF SEAT

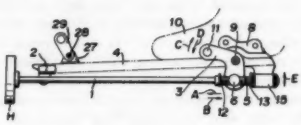
Kinsho Fukuta, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 18, 1983, Ser. No. 467,662

Claims priority, application Japan, Mar. 19, 1982, 57-39160[U]

Int. Cl.³ F16H *27/02*

U.S. Cl. 74—89.15 **18 Claims**



1. A device for adjusting the height of a seat cushion in the rear part of a seat having a rotary handle attached to the seat, a threaded rod provided with the handle, and a stationary member secured with the seat substantially at the center, comprising:

a movable element engaged with a threaded part of said rod;

a link rockably mounted at said stationary member, pivotally secured at a first end thereof to said element and pivotally secured at a second end thereof to the rear part of said seat;

a bearing section operatively associated with said stationary member for bearing an end portion of said rod;

a first stationary ring mounted on a portion of said rod at the position corresponding to a first end of said bearing section;

a first synthetic resin ring having large friction reducing effect interposed between and in contact with said first end of said bearing section and said stationary ring; and

a second stationary ring mounted on a portion of said rod at a position corresponding to a second end of said bearing section;

a second synthetic resin ring and a cushion material ring interposed in compressed manner between and in contact with a second end of said bearing section and said second stationary ring.

4,522,079

CONTINUOUSLY VARIABLE TRANSMISSION UNIT

Yves J. Kemper, Birmingham, Mich., assignor to Caterpillar Tractor Co., Peoria, Ill.

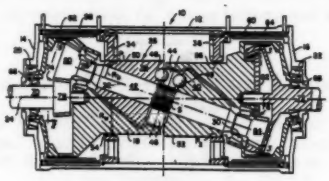
PCT No. PCT/US80/00582, § 371 Date Dec. 23, 1981, § 102(e) Date Dec. 23, 1981, PCT Pub. No. WO81/03369, PCT Pub. Date Nov. 26, 1981

PCT Filed May 19, 1980, Ser. No. 348,938

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.³ F16H *15/16, 15/00, 15/50*

U.S. Cl. 74—191 **10 Claims**



1. In a continuously variable transmission having a rotatable input, a rotatable output, a frame, an alpha body supported by said frame for rotation about a first axis, a biconical beta body supported by said alpha body for rotation on a second axis inclined with respect to and intersecting said first axis at a point of axes intersection located centrally along the length of said beta body so that movement of said second axis is confined to nutation on said point and about said first axis, said beta body having a pair of beta traction surfaces of revolution about said second axis one such surface being located on each side of said point of axes intersection, means for defining a pair of omega surfaces of revolution about said first axis, said beta and omega surfaces being in rolling friction engagement with each other at two points in a plane containing said first and second axes, said beta and omega surfaces further defining a radius ratio which is variable upon shifting the location of said points of rolling friction engagement relative to said point of axes intersection, the improvement comprising:

first means for supporting said alpha body for rotation about said first axis dependent solely on the speed at which said second axis is driven in nutation about said first axis by said beta body;

second means for drivingly coupling said input and said beta body and defining a first gear ratio factor;

third means for drivingly coupling said beta body and said output and defining a second gear ratio factor differing from said first gear ratio factor; and

said first and second gear ratio factors being related to said variable radius ratio so that the range of output/input speed ratios of the transmission is greater than the range of such speed ratios attainable by said radius ratio alone.

4,522,080

LAMINATED WHEEL ASSEMBLY

John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corp., Wauwatosa, Wis.

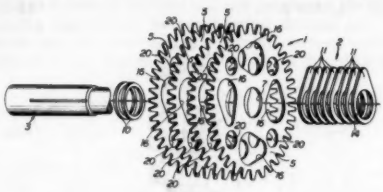
Filed Jul. 30, 1982, Ser. No. 403,465

Int. Cl.³ F16M *55/12;* **B21D** *53/28*

U.S. Cl. 74—445 **4 Claims**

1. A wheel assembly, comprising a rotatable support member, and a pair of wheels fixedly secured to said support member and disposed in axially spaced relation to one another, each of said wheels including a laminated stack of flat plates disposed in abutting relation to one another, each of said plates having an opening formed therethrough disposed in axial registry for frictionally receiving said support member so that the frictional force between said plates and said support member provides the substantially sole means for maintaining said

plates in substantially abutting relationship, one of said wheels includes integral teeth formed in its periphery to provide a laminated gear and the other wheel includes an integral cam surface formed in its periphery to provide a laminated cam, and



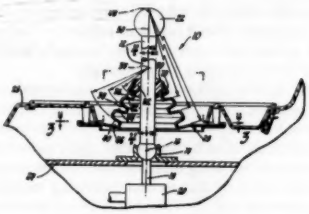
each of the individual plates of said cam is stamped from the individual plates of said gear so that at least two of the individual plates of said cam are stamped from each of the individual plates of said gear at equi-angularly spaced apart locations to provide a plurality of cam-shaped apertures therein.

4,522,081

BOOT COVER FOR A FLOOR-MOUNTED TRANSMISSION LEVER

Steven J. Mackin, Pontiac, and Harry T. Tillotson, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1983, Ser. No. 561,321
Int. Cl.³ G05G *9/00*; F16J *15/52*
U.S. Cl. 74—473 R **3 Claims**



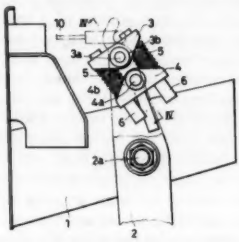
1. An improvement in boot covers for a floor mounted manually operated transmission shift lever wherein the shift lever has a pivot axis and a handle longitudinally displaced from the pivot axis and wherein said boot cover is of a geometrical shape which converges toward an apex which is disposed substantially on the shift lever between the handle and the pivot axis; wherein the improvement comprises: said boot cover having a plurality of lower and upper spherical surfaces, each said lower surface having respective center of radii disposed at a common point displaced from the apex a distance equal to the distance between the apex and the pivot axis the largest of said radial dimensions being less than twice the distance between said apex and said pivot axis; and each said upper surface having a common center of radii disposed at the apex and the radial dimension of each said upper surface being less than the radial dimension of each said lower surface, each said lower surface being connected to each said upper surface immediately adjacent thereto and disposed toward said handle therefrom by an inner wall and to the other upper surface adjacent thereto by an outer wall.

4,522,082

PEDAL ASSIST APPARATUS

Raita Musumiya, Kawagoe; Hideo Sano, Kuki; Yasuto Izichi, Kuki; Mitsuru Inoue, Kuki, and Kenzyu Izawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Fukuda Press Kogyo Kabushiki Kaisha, Saitama, both of, Japan

Filed May 4, 1983, Ser. No. 491,384
Claims priority, application Japan, May 4, 1982, 57-637772; May 4, 1982, 57-63773; Jun. 23, 1982, 57-92995
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—512 **4 Claims**



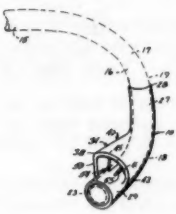
1. An assist apparatus for a pedal including a pedal arm supported on a machine frame through a supporting shaft so as to be turnable between its inoperative position on one side and its operative position on the other side, a first spring seat and a second spring seat facing the first spring seat turnably supported on the pedal arm and the machine frame, respectively, through a first seat shaft on the pedal arm and a second seat shaft on the machine frame which are parallel with the supporting shaft, and a spring means provided between the two spring seats so that the two seats thereby are urged along a direction of a connecting line connecting between an axis of the first seat shaft and an axis of the second seat shaft, characterized in that each of the seats is provided with inwardly projecting opposite side walls, and is turnably mounted and supported on each of the seat shafts at the opposite side walls thereof, and the spring means comprises a pair of springs disposed at symmetrical positions on both sides of the connecting line.

4,522,083

BICYCLE HANDLEBAR GRIPS

Clyde R. Morgan, Box 302, Coeur d'Alene, Id. 83814

Continuation of Ser. No. 211,073, Nov. 28, 1980, abandoned. This application Aug. 10, 1983, Ser. No. 522,189
Int. Cl.³ B62K *21/26*
U.S. Cl. 74—551.9 **6 Claims**



1. A handlebar grip for a bicycle with a racing bicycle handlebar having a drop portion which is substantially tubular about a central axis and includes (1) a substantially straight end section that extends from a terminal rear end forward in the intended direction of travel of the bicycle and (2) a front

curved section that is formed integrally with the straight section and extends upwardly therefrom in a curved shape, comprising:

an elongated cylindrical tubular body made of flexible material and having an internal cylindrical bore adapted to coaxially receive the straight end section of the drop portion of a handlebar and also to extend upward along a portion of its front curved section;

said tubular body having an upwardly curved neck segment terminating at a forward end and adapted to extend along the front curved section of the drop portion of a handlebar and an integral finger gripping segment terminating at a rear end and adapted to extend along the straight end section of the drop portion of a handlebar; said finger gripping segment having an upper side and a lower side extending between opposed inner and outer sides;

an integral enlarged palm and thumb cheek support member extending longitudinally along and above the finger gripping segment of the said tubular body;

said enlarged palm and thumb cheek support member extending radially outwardly from both the inner and outer sides of the finger gripping segment of the tubular body to partially encircle the finger gripping segment of the tubular body and being spaced apart therefrom in an overlapping position across the upper side thereof;

said enlarged palm and thumb cheek support member extending longitudinally along the tubular body from a forward end at the intersection of the finger gripping segment and the curved neck segment to a rearward end adjacent the rear end of the finger gripping segment;

said enlarged palm and thumb cheek support member having (1) a convex outer surface that extends radially outward and upward from the outer side of the finger gripping segment to support the palm of a cyclist's hand adjacent to the cyclist's fingers; (2) an overlying surface extending from the convex surface over the finger gripping segment to a thumb ridge above the inner side of the finger gripping segment for supporting the cyclist's thumb cheek and the hand palm adjacent the thumb cheek; and (3) a finger tip surface extending inward and downward from the thumb ridge to the finger gripping segment in which the finger tip surface is adapted to receive the finger tips; and

vibration absorbing means comprising resilient material interposed between said enlarged palm and thumb cheek support member and the tubular body for absorbing vibrations of the bicycle handlebar to minimize the transmission of such vibration from the handlebars to the cyclist's hands to minimize biker's fatigue and biker's nerve palsy.

4,522,084

STEERING WHEEL FOR A VEHICLE

Masahiro Takimoto, Aichi, and Satoshi Ota, Konan, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 11, 1983, Ser. No. 541,000
Claims priority, application Japan, Oct. 30, 1982, 57-190946
Int. Cl.³ C08K *5/57*; B62D *1/04*
U.S. Cl. 74—557 **6 Claims**

1. In a vehicle steering wheel formed from a molded polyvinyl chloride resin which is in physical contact with a molded polyurethane resin, the improvement wherein said molded polyvinyl chloride resin contains a color change-inhibiting amount of a heat stabilizer selected from the group consisting of:

(i) 1 to 3 phr of an organotin maleate; and

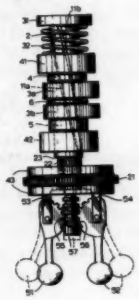
(ii) 1 to 4 phr of a zinc soap and 0.3 to 1.0 phr of an organophosphite.

4,522,085

VARIABLE LOBE CAM MECHANISM

Garold L. Kane, 1112 W. Kiowa, Colorado Springs, Colo. 80904

Filed Aug. 30, 1982, Ser. No. 412,915
Int. Cl.³ F16H *53/00*; F01L *1/34*; F16D *1/00*; F16B *3/00*
U.S. Cl. 74—568 R **15 Claims**



1. A continuously variable lobe cam mechanism for controlling the opening and closing of valves in an internal combustion engine comprising:

a camshaft having first and second oppositely directed and independently pitched slots running generally longitudinally to said camshaft on the periphery thereof;

a cam member having a cam surface and mounted on said camshaft for rotation therewith, said cam member adapted for longitudinal movement relative to said camshaft and comprising first and second cooperating cam bodies which are maintained in fixed axial position with respect to one another, each of said cam bodies being axially fixed with respect to one another and forming a portion of said cam surface and each of said cam bodies being adapted for independent limited rotational movement in opposite directions relative to said camshaft in respone to longitudinal movement of said camshaft relative to said cam bodies, each of said cam bodies further having a generally cylindrical bore extending therethrough;

first and second following means connected respectively with first and second cam bodies and being respectively slidably disposed in said first and second slots to provide opposing relative rotations of said cam bodies upon movement of said first and second following means within the respective first and second slots said first and second following means extending inwardly from the surface of said cylindrical bore of its respective first and second cam body for engagement with said first and second slot;

rotational drive means operatively attached to said camshaft; and

means operatively attached to said camshaft for moving said camshaft longitudinally with respect to said cam member as a function of the rotational speed of said camshaft.

4,522,086

CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION

William J. Haley, Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

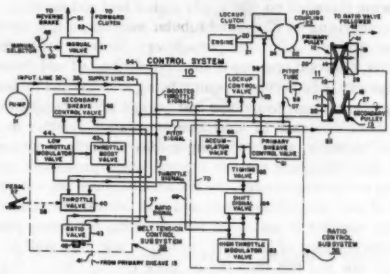
Filed Apr. 24, 1981, Ser. No. 257,035
Int. Cl.³ B60K *41/12*, *41/14*
U.S. Cl. 74—867 **9 Claims**

2. A control system for a continuously variable transmission having primary and secondary pulleys, each having a fixed sheave and a movable sheave, and a belt intercoupling the pulleys, which control system comprises

a supply line, means for establishing fluid flow in the supply line, and a secondary sheave control valve coupled to the

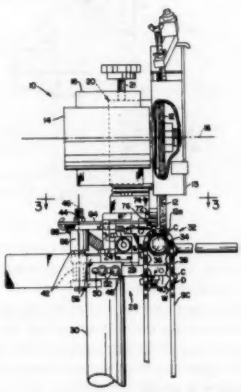
supply line for regulating the line pressure supplied to the secondary pulley movable sheave,

a throttle valve connected to develop a throttle pressure signal as a function of throttle opening, which throttle pressure signal is utilized to regulate the secondary sheave control valve in a sense to increase said line pressure as the throttle opening indicates an increased torque demand and to decrease said line pressure as the throttle opening indicates a reduced torque demand, thus providing a throttle-sensitive



regulation of the fluid pressure in the supply line to the secondary pulley movable sheave, and further comprising a bore in which said throttle valve is positioned, a second spool positioned in the same bore, a spring positioned between the throttle valve and the second spool, a movable sleeve affixed to said second spool, and means, including a drive mode selector, for applying fluid under pressure to one end of said sleeve for displacing the second spool and compressing the spring, simulating a manual-low throttle position in the system.

4,522,087
SAW CHAIN DEPTH GAUGE GRINDER
Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524
Filed Oct. 21, 1983, Ser. No. 544,435
Int. Cl.³ B23D *63/16*
U.S. Cl. 76—25 A **18 Claims**



1. A saw chain grinding machine for grinding the depth gauges of saw chain cutter links each having both a front depth gauge and a rear cutter tooth, said machine comprising:

grinding means including a grinding surface;

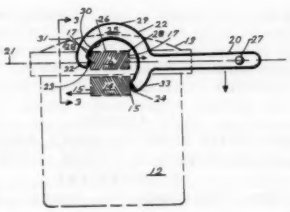
carrier means for mounting a saw chain with a cutter link in predetermined position for grinding the depth gauge thereof, said carrier means and grinding means being movable relative to one another in a predetermined path to move said cutter link depth gauge toward and away from said grinding means;

mounting means mounting said carrier means and said grinding means for generally vertical relative movement therebetween;

indexing means positioned along said path and cooperable with the cutter tooth to induce generally vertical relative movement between said grinding means and said carrier means when said carrier means is moved along said path to determine the grinding position of said grinding surface relative to the depth gauge;

and shield means positioned along said path for engagement with the top of the cutter tooth and the indexing means to prevent direct contact between said indexing means and said cutter tooth upon said relative movement along said path between said grinding means and said carrier means.

4,522,088
TOOL FOR OPENING A PRESSURE COOKER
Malcolm F. Berglund, 858 N. 64th St., Mesa, Ariz. 85205
Filed Dec. 19, 1983, Ser. No. 563,204
Int. Cl.³ B25B *27/00*
U.S. Cl. 81—3.55 **5 Claims**

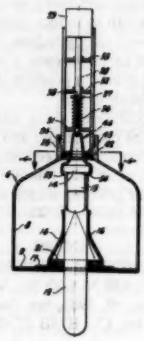


1. A manually operable hand tool for causing the lid of a pressure cooker to rotate with respect to the underlying vessel of said pressure cooker, and adapted to engage the vertical sides of vertically aligned handles of said lid and vessel, said tool comprising a handle portion elongated about a center axis, and a gripping head disposed at one extremity of said handle portion as a continuous integral extension thereof, said gripping head being of bifurcated configuration and comprised of an arcuately shaped spanning member having first and second extremities and defining an engulfing area, a forward abutment site and a rearward abutment site disposed in facing relationship adjacent said first and second extremities, respectively, said engulfing area extending above said forward abutment site and rearward of said rearward abutment site, and an upper abutment site located on said spanning member within said engulfing area, whereby placement of said tool over the aligned handles of said pressure cooker in a manner such that an upper edge of the lid handle contacts said upper abutment site causes said forward abutment site to contact a vertical side of said lid handle and said rearward abutment site to contact an opposite vertical side of the underlying vessel handle, and subsequent downward motion of said handle portion applies a concerted pushing force to said vessel and pulling force to said lid.

4,522,089
TEST TUBE CAP REMOVER
Javid R. Alvi, 7970 Larwin Dr., Citrus Heights, Calif. 95610
Filed Oct. 28, 1983, Ser. No. 546,237
Int. Cl.³ B67B *7/02*
U.S. Cl. 81—3.42 **10 Claims**

1. A test tube cap remover for use with a test tube removably engaging a cap having a flange comprising means defining an enclosure having first and second openings disposed in alignment, yielding means continuous with said enclosure and sur-

rounding said first opening for deflecting between a closed position and an open position, supporting means continuous with said enclosure and surrounding said second opening, a cap engaging means within said enclosure, means for mounting



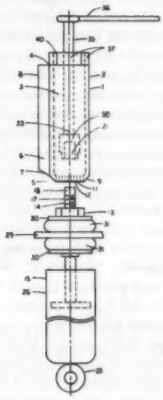
said cap engaging means on said supporting means for movement between a cap engaging and holding position and a cap releasing position, and means for moving said cap engaging means between said positions.

4,522,090

COMBINATION VEHICLE, SHOCK ABSORBER AND TOOL TO REMOVE SAID SHOCK ABSORBERS FROM SAID VEHICLE

Donald Kittle, 2427 Ingalls Ave., Apartment 304, Joliet, Ill. 60435

Filed May 2, 1983, Ser. No. 490,933
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—55 **8 Claims**



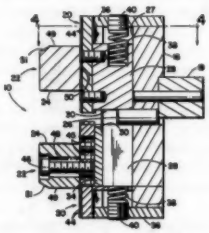
1. A combination vehicle, shock absorber and tool to remove said shock absorber from said vehicle, wherein said vehicle includes a first frame portion and a second frame portion, said first frame portion being relatively fixed in relation to the body of said vehicle, said second frame portion being relatively fixed in relation to a corresponding one of the axles and wheels of said vehicle, said shock absorber having a shock absorbing cylindrical member connected at one end to said second frame portion, and a reciprocating rod member connected at the oposite end of said shock absorber to said first frame portion, a retaining nut, said retaining nut connecting said shock absorber to said first frame portion, said first frame portion including a well having a peripheral side wall defining a cavity other than circular in cross-section in which a first portion of said side wall is relatively closer to the central axis of said well, a second portion of said side wall which is relatively farther from the central axis of said well than said first portion, said well including a bottom floor thereof, an aperture through said floor centered on its said central axis, the upper end of said reciprocating rod member of said shock absorber extending through said aperture into said well, said retaining nut being threaded on said upper end of said rod member, said tool comprising an elongated tubular member, a first opening to one end of a through-passageway through said tubular member, a second opening to the opposite end of said through-passageway, said second opening being annular and including engagement means to receive and engage said retaining nut of said shock absorber to hold against rotation relative to said tubular member, and projecting means projecting outwardly from said elongated tubular member, said projection means having an outermost edge, the distance between the outermost edge of said projection means and said central axis when said tubular member is seated on said retaining nut being greater than the distance of said first portion of said side wall to said central axis and less than the distance of said second portion thereof to said central axis.

4,522,091

BAR PULLER

Joseph F. Toffolon, Southington, Conn., assignor to Progressive Machinery Sales, Inc., Southington, Conn.

Filed Jan. 5, 1984, Ser. No. 568,378
Int. Cl.³ B23B *25/00, 13/12*
U.S. Cl. 82—38 R **19 Claims**



13. A bar puller for a lathe having a turret including a plurality of tool stations, said bar puller comprising a housing having a forwardly opening channel, shank means attached to said housing for mounting said bar puller at one of the tool stations, a pair of jaw assemblies slidably supported in said channel and including a pair of jaws having opposing jaw surfaces exposed forward of said channel for gripping an associated end portion of a bar, a rigid jaw centering element mounted in fixed position on said housing and disposed within said channel between said jaw assemblies, said jaw assemblies having opposing abutment surfaces thereon, and means for biasing said jaw assemblies toward each other and to a bar receiving position wherein said abutment surfaces are disposed in abutting engagement with said rigid jaw centering element and said jaw surfaces are disposed in spaced apart relation to each other to receive and grip a portion of a bar forcibly inserted into said jaws between said opposing jaw surfaces.

4,522,092

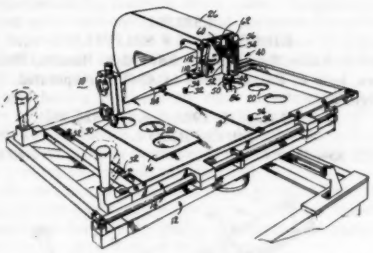
PALLET NIBBLER METHOD

Adolph S. Dorosz, 5 Bass River Rd., Beverly, Mass. 01915

Filed Jun. 29, 1983, Ser. No. 508,835

Int. Cl.³ B26D *3/00, 7/26*

U.S. Cl. 83—40 **6 Claims**



1. A method for manufacturing a configured cut-out in a sheet of material, comprising the steps of:

arranging a first die to support a sheet of material thereon;

bringing a second die into opposite relationship with said first die, so as to be able to secure a sheet of material therebetween;

pushing a punch shaft through said first die;

punching a hole through said sheet of material with said punch shaft and into said second die; and

lowering said punch shaft while still keeping it through said hole and while moving the sheet of material to initiate nibbling of the sheet of material by said punch shaft.

4,522,093

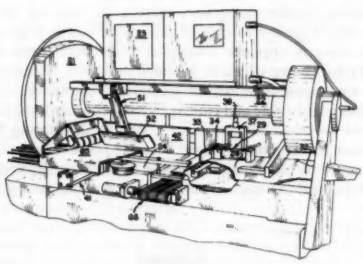
SLICER FEED MECHANISM

James A. Rattmann, Sun Prairie, Wis., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 12, 1984, Ser. No. 588,267

Int. Cl.³ B26D *3/22*

U.S. Cl. 83—42 **18 Claims**



1. A feed mechanism of the type that feeds a food product to a slicing assembly having a slicer blade, the feed mechanism including a support assembly for slidingly supporting a food product, and a gripper assembly for gripping a rear end of the food product and for moving the gripped food product along the support assembly and to the slicer blade, the feed mechanism including a semi-automatic feed assembly comprising:

a slidable shelf assembly generally parallel to the support assembly, said slidable shelf assembly being at a height greater than the height of the support assembly;

a rear pusher assembly closely spaced from the top surface of the slidable shelf assembly and generally rearwardly located with respect to the slicing assembly; and

means for automatically aligning a food product into a prefeed orientation with respect to the slicer blade and with respect to the gripper assembly, said automatic aligning means including means for pushing against the food product, and said prefeed orientation being below said slidable shelf assembly.

13. A method for feeding a food product to a location for slicing the food product, during which the rear end of the food product is gripped and the food product is fed along a feed path and to the slicing location, comprising:

positioning a food product onto a slidable shelf located above and generally parallel to the feed path;

moving the slidable shelf in a direction generally away from the slicing location while engaging the food product to limit its movement away from the slicing location, whereby the food product on the slidable shelf slides off of the slidable shelf and drops onto the feed path;

automatically aligning the food product on the feed path into a prefeed orientation that is aligned with respect to the slicing location;

gripping the food product and feeding the gripped food product to the slicing location in order to slice the food product into a plurality of slices; and

moving the slidable shelf in a direction generally toward the slicing location and above the feed path of the food product.

4,522,094

AUTOMATIC LAMINATION CUTTING MACHINE FOR ELECTRIC SHUNT INDUCTION WINDING

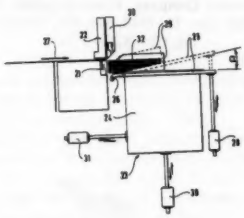
Gérard Messé , Maule; Michel Faure, Houilles, and Marcel Ducombs, Rueil-Malmaison, all of France, assignors to Alsthom-Atlantique, Paris, France

Division of Ser. No. 262,878, May 12, 1981, Pat. No. 4,453,150. This application Mar. 5, 1984, Ser. No. 586,464

Claims priority, application France, May 12, 1980, 80 10574

Int. Cl.³ B26D *7/32*

U.S. Cl. 83—92 **1 Claim**



1. An automatic sheet metal cutting machine which includes means for continuously supplying the machine with metal strip in adjustable lengths and at will, cutting means and means for receiving the laminations cut from the metal strip, wherein the means for receiving the laminations include a swivelling plate which can move through an angle of α at will about a pin perpendicular to the direction of motion of the laminations, means for lowering the receiving means and means for moving the receiving means downstream relative to the direction of motion of the laminations.

4,522,095

HOLE PUNCH FOR A CUTTING DIE

Philip G. Saunders, and Jack R. Simpson, both of Toledo, Ohio, assignors to Container Graphics Corporation, Toledo, Ohio

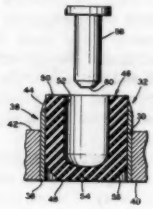
Filed Sep. 21, 1982, Ser. No. 420,729

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—116 **1 Claim**

1. A cutting die forming a hole in corrugated board or the like, said cutting die including a die plate having a front surface and a back surface, an open ended tubular member held by said

die plate and having one open end terminating at the back surface of said die plate, said member having another open end extending beyond the front surface of said die plate and terminating in a cutting edge, and a body of resilient material within said tubular member and having an outer diameter normally slightly exceeding the inner diameter of said tubular member, said resilient body having a central recess in one end terminating near the cutting edge of said tubular member, said resilient body having a transverse wall at said other end thereof, with



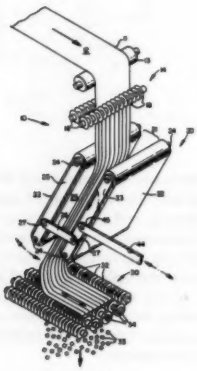
the back surface of said transverse wall, the back surface of said die plate, and said one end of said tubular member being substantially in a common plane, said recess of said resilient body extending from 75 to 90 percent of the length of said body with the thickness of said transverse wall being about equal to the thickness of the side wall of said body, the outer surface of said body being cylindrical and said body having an annular chamfer, therearound where the outer cylindrical surface thereof would otherwise meet the back surface of said transverse wall.

4,522,096

DICING APPARATUS FOR SHEET MATERIAL

Benjamin F. Niven, Jr., Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 16, 1983, Ser. No. 505,414
Int. Cl.³ B26D *7/20*
U.S. Cl. 83—408 **4 Claims**



1. Apparatus for cutting continuous sheet material into quadrilateral pieces, comprising:

means for longitudinally slitting the sheet into continuous ribbons;

a cutting bed, including a first plurality of spaced parallel powered shafts defining a first cutting array, a second plurality of spaced parallel powered shafts defining a second cutting array, said first and second plurality of shafts oriented parallel to said ribbons and said first cutting array being arranged to lie in a plane vertically spaced from a plane defined by said second cutting array, each of said shafts carrying thereon a plurality of circular blades spacedly affixed thereto; and

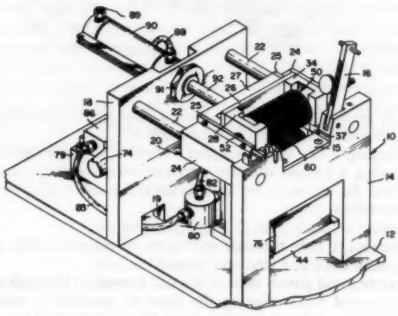
swing assembly means interposed between said slitting means and said cutting bed, for receiving said continuous ribbons and lapping said ribbons atop said cutting bed.

4,522,097

RIBBON CABLE SPLITTER

Daniel T. Adlon, Swatara, and Edward A. Bianchi, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 25, 1983, Ser. No. 526,302
Int. Cl.³ B26D *1/18*
U.S. Cl. 83—464 **10 Claims**



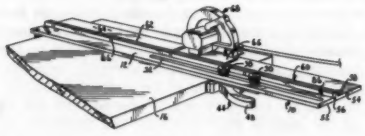
1. An apparatus for separating the individual conductors of a ribbon cable, the apparatus being of the type comprising first and second rollers having parallel axes, each roller comprising a plurality of parallel radially extending annular teeth having spaces therebetween, the centerline spacing of adjacent teeth of each roller being twice the centerline spacing of adjacent conductors of the ribbon cable, the teeth on each roller being aligned with the spaces on the other roller, the circumferential surface of each annular tooth being generally concave, the apparatus further comprising means for moving the rollers relatively together to engage said cable and to urge adjacent conductors in opposite directions to separate them, alternate conductors being urged in the same direction, characterized in that said apparatus further comprises clamping means for clamping said cable and carriage means for moving said rollers relative to said clamping means, said teeth rotating freely in response to movement of said carriage means when said cable is clamped by said clamping means and engaged by said rollers, whereby said conductors are separated along a length of the cable.

4,522,098

SAW GUIDE

Delbert N. Bliss, Rt. 4, Box 111, Winfield, Kans. 67156

Filed Feb. 27, 1984, Ser. No. 584,010
Int. Cl.³ B27B *9/04*
U.S. Cl. 83—745 **5 Claims**



1. A guide for portable circular saws having a supporting

member adapted for sliding along a surface, said guide comprising:

an elongated, rigid frame having a flat bottom surface, said frame being adapted to extend across an item to be sawed;

an abutment secured to the frame and depending therefrom, said abutment including a flat surface in position to be engaged against an edge of the item;

block means slidably mounted on the frame in longitudinally spaced apart relationship from said abutment flat surface and depending from the frame in disposition to engage against a second edge of the item to clamp the latter between the abutment and the block means;

said frame having an elongated, rigid rib intermediate the sides of the frame and extending longitudinally of the latter, said rib having a side edge adapted to receive said saw support member thereagainst to guide the saw as the saw is moved along said rib edge; and

manually operable means secured to the frame and operably coupled with said block means to move the block means toward said abutment to selectively increase the clamping force on the item clamped therebetween;

said block means including a mount, means releasably securing the mount to the frame at any selected position longitudinally thereof, a block having a flat edge surface adapted to engage said item second edge, and means securing the block to the mount to permit limited lost motion between the block and the mount toward and away from the abutment; and

said manually operable means including a cam rotatably secured to the mount and engagable with the block in position to engage the block and move the block flat surface toward the abutment to increase the clamping force on the item responsive to manual rotation of the cam.

4,522,099

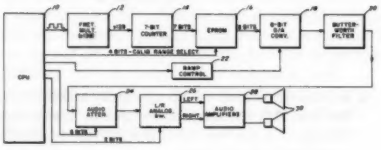
TONE GENERATOR

Thomas Melsheimer, Longmont, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Dec. 14, 1983, Ser. No. 561,172

Int. Cl.³ G10H *7/00*

U.S. Cl. 84—1.01 **7 Claims**



1. A tone generator comprising:

a clock generating a series of electrical pulses having the same frequency as the desired tone;

a frequency multiplier operatively connected to said clock, generating as its output a series of electrical pulses having a frequency equal to an integral multiple of the clock frequency;

a counter that is operatively connected to said frequency multiplier, generating as its output a binary count of the input pulses generated by the frequency multiplier; said counter having a predetermined number of binary digits such that the number of pulses generated by the frequency multiplier in response to one pulse produced by the clock will cause the counter to increment through its entire range of output values exactly once;

a memory comprising a plurality of arrays, each array comprising a series of elements in which have been stored binary values of the waveform of the tone to be generated, as sampled along one cycle of said waveform; the contents of each element within a given array of said memory being uniquely addressed by the binary count generated by the counter, and the specific array being uniquely addressed by a number of additional calibration selector bits that are set by external means; each array having a predetermined length equal to the multiplication factor of the frequency multiplier, so that the contents of the selected array are sequentially read out of the memory exactly once for each pulse generated by the clock;

a digital-to-analog converter that accepts as its input the digital values read out of the memory, and converts said digital values into an analog waveform.

4,522,100

ELECTRONIC MUSICAL INSTRUMENT FOR READING OUT AND PERFORMING MUSICAL TONE DATA PREVIOUSLY STORED

Hiroshi Ishii, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 189,760, Sep. 23, 1980,. This application Sep. 7, 1982, Ser. No. 415,439

Claims priority, application Japan, Sep. 29, 1979, 54-126185; Sep. 29, 1979, 54-126186; Sep. 29, 1979, 54-126187; Sep. 29, 1979, 54-126188

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **20 Claims**

1. An electronic musical instrument comprising:

a single keyboard having a plurality of keys, each being associated with a musical note;

memory means for storing pitch codes of the musical tone of either a melody or an accompaniment of a musical piece;

changeover switching means coupled to said keyboard for switching an operation mode of said keyboard to first and second modes, in said first mode the keys on said keyboard designating the musical notes, in said second mode the keys on said keyboard being functionally and fixedly divided into two key groups and in said second mode the keys on either of said two key groups on the keyboard permitting readout of the pitch codes stored in said memory means and the other of said key groups designating the musical notes;

musical tone generating means coupled to said keyboard, to said memory means and to said changeover switching means for generating musical tones in accordance with a key operation on said keyboard when said operation mode is switched to said first mode, and for generating musical tones corresponding to the pitch codes read out from said memory means by keys of either of said two key groups and to the musical notes designated by the keys of the other of said key groups when said operation mode is switched to said second mode;

first control means coupled to said memory means and to said changeover means and being responsive to operation of any one of the keys of one of said two key groups for causing the pitch code of said musical tone stored in said memory means to be read out and causing said musical tone to be formed by said musical tone generating means

when said operation mode is switched to the second mode; and

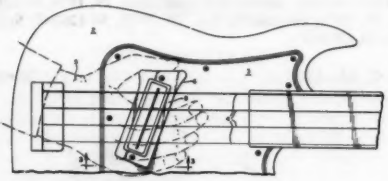
second control means coupled to said musical tone generating means and to said changeover switching means and being responsive to a manual operation of keys of the other of said two key groups for causing the musical tone corresponding to the operated keys to be formed by said musical tone generating means when said operation mode is switched to the second mode.

4,522,101

MOUNTING RING AND THUMBREST

Hartley D. Peavey, and Michael V. Powers, both of Meridian, Miss., assignors to Peavey Electronics Corp., Meridian, Miss.

Filed Oct. 18, 1982, Ser. No. 434,869
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.16 **6 Claims**



1. A mounting ring-thumbrest for an electric stringed instrument comprising:

mounting means for receiving a pickup means, and adapted to be attached to a body of the instrument, and

thumbrest means for supporting the thumb of a person playing said instrument, said thumbrest means being integrally formed with said mounting means, wherein said mounting means forms an elongate cavity for receiving said pickup, and

said thumbrest means is located at one end of said mounting means and provides a concave surface for receiving said thumb.

6. A stringed musical instrument comprising pickup means for detecting vibrations of a string, said pickup means having means for receiving a mounting screw, body means having a cavity receiving said pickup means therein, said body means having a first hole, mounting ring means at least partially surrounding said pickup means, said mounting ring means having a second hole, and spring means, wherein said mounting screw extends through said first and second holes, said spring means and into said means for receiving, and wherein said spring means extends between said means for receiving and said body means whereby said mounting ring and pickup means are secured to said body means by said screw means and said spring means.

4,522,102

SEMI-AUTOMATIC CARTRIDGE RELOADING MACHINE

Ralph D. Pickens, 49162 McCoy Ave., East Liverpool, Ohio 43920

Filed Jun. 27, 1983, Ser. No. 508,342
Int. Cl.³ F42B *33/02*
U.S. Cl. 86—27 **9 Claims**

1. In a semi-automatic cartridge reloading machine in combination:

a base structure,

a lower travelling platen supported on the base structure,

a positioning mechanism for raising and lowering the lower travelling platen relative to the base structure,

a indexing table and shell holder plate supported by the lower elevating platen and defining a plurality of operating stations spaced circumferentially about an imaginary circle having a vertical axis,

a plurality of shell rim slots equally, circumferentially spaced about each shell holder plate, each of such shell rim slots being adapted to receive a separate shell casing, and to position such received shell casings simultaneously in different ones of the operating stations,

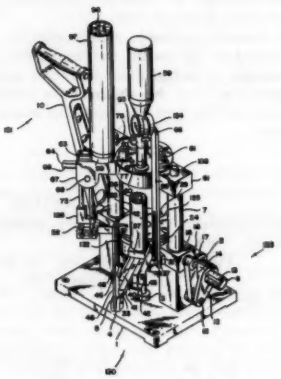
a stationary upper platen containing a plurality of tools or dies depending or extending vertically through the stationary upper platen and defining a plurality of operating stations spaced circumferentially about an imaginary circle having a vertical axis,

the improvement of an indexing drive mechanism which operates simultaneously with and in conjunction with the raising and lowering of the lower travelling platen and is engageable with the indexing table and shell holder plate for rotating the indexing table and shell holder plate to position shell casings received in the indexing table and shell holder plate sequentially in each of the operating stations comprising in combination:

a. a clevis secured to the base structure;

b. a bar pivotally secured to and extending upwardly, vertically from the clevis;

c. a bar slot formed in the upper end portion of the bar to accept a crank pin;



d. a crank pin which travels upwardly and downwardly in the bar slot simultaneously and in conjunction with raising or lowering the lower travelling platen by the positioning mechanism;

e. a curvilinear shaped crank extending axially from and secured to the crank pin at one end which rotates in one direction as the crank pin contacts the top or bottom of the bar slot and having a pinion pin secured and extending axially at the other end;

f. a housing extending radially from the circumference of the lower travelling platen which journals and supports the pinion pin and pinion;

g. a pinion comprised of a plurality of gear teeth positioned within the housing and journalling and secured to the pinion pin which rotates correspondingly with the rotation of the crank and engages a rack;

h. a rack comprised of a plurality of corresponding gear teeth formed in the underside of one end of an indexing ram which travels in a horizontal plane across the pinion as the pinion is rotated and correspondingly slides the indexing ram into and out of the lower travelling platen;

i. an indexing ram with a rack formed in the underside of one end of a pawl pivotedly secured at the other end which slides into and out of the lower travelling platen on rotation of the pinion;

j. a ram slot formed in the top surface of the lower travelling platen to accept the indexing ram and extending from the circumference to the center portion of the top surface of the lower travelling platen;

k. a pawl pivotedly secured to the end of the indexing ram which drivingly engages and rotates a ratchet secured to and extending axially from an indexing table center pin;

l. a ratchet secured to and extending axially from an indexing table center pin and recessed into a recess hole formed in the top surface at the center portion of the lower travelling platen;

m. a recess hole formed in the top surface at the center portion of the lower travelling platen to accept the ratchet and indexing table center pin;

n. an indexing table center pin positioned vertically within a recess hole secured to a ratchet and secured to the indexing table and shell holder plate to rotate the indexing table and shell holder plate to move and position shell casings between adjacent operating stations as the ratchet is engaged by the pawl on each cycle of operation;

o. a pawl return spring positioned within a spring hole formed in the pawl end of the indexing ram and biased against and between the pawl and an adjusting means set in the indexing ram to return the pawl to rest position after each cycle of operation;

p. a spring hole formed in the pawl end of the indexing ram to accept the pawl return spring;

q. an adjusting means set in the pawl end of the indexing ram to adjust the pawl return spring;

r. a pawl stop screw disposed at and extending into a stop screw hole formed in the pawl end of the indexing ram which engages the pawl and may be adjusted in and out of the indexing ram to correct for wear to the pawl or ratchet;

s. a stop screw hole formed in the pawl end of the indexing ram to accept the pawl stop screw;

t. a key slot formed through the center portion of the indexing ram to slide across a register key correspondingly disposed in the ram slot which enters the key slot on each cycle of operation to assure stop lock action of the rotation of the indexing table and shell holder plate;

u. a register key disposed in the ram slot biased vertically, upwardly against the indexing ram by a register key spring and positioned to enter the key slot formed in the indexing ram on each cycle of operation; and

v. a register key spring secured to the underside of the indexing ram to bias the register key vertically, upwardly against the underside of the indexing ram.

4,522,103

TRAP FOR AN UMBILICAL PLUG SEPARATED FROM A MISSILE

Erik L. Mitzner, Mountain View, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1982, Ser. No. 374,677

Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.811 **6 Claims**

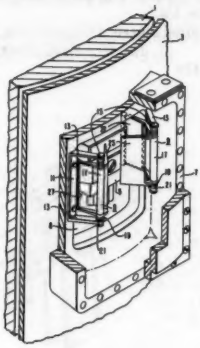
1. An umbilical plug trap for trapping and retaining an umbilical plug separated from a missile said umbilical plug trap comprising:

a pair of spaced-apart brackets;

a rotatable member rotatably disposed on each bracket;

each rotatable member having affixed rigidly thereto a first arm disposed in the path of said umbilical plug and a

second arm disposed at an angle with respect to the first arm and out of the path of the umbilical plug; and means for limiting the direction of rotation of said rotatable members and arms to a single direction and for limiting the extent of said rotation, whereby said umbilical plug contacts said first arms, rotates said rotatable member



and arms to their limits and said first arms stop said umbilical plug and said second arms prevent rebounding of said umbilical plug, trapping and retaining it between said first and second arms.

4,522,104

APPARATUS FOR AN AIRCRAFT FOR DROPPING OBJECTS, ESPECIALLY BOMBS

Max Degen, Luzern, Switzerland, assignor to Schweizerische Eidgenossenschaft vertreten durch die Gruppe für Rüstungsdienste, Emmen, Switzerland

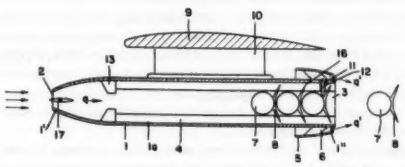
Continuation-in-part of Ser. No. 220,825, Dec. 29, 1980, Pat. No. 4,424,733. This application Sep. 26, 1983, Ser. No. 536,169

Claims priority, application Switzerland, Sep. 29, 1980, 7264/80

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.³ F41F *5/02*

U.S. Cl. 89—1.51 **19 Claims**



1. An apparatus for an aircraft for dropping objects, especially explosive objects such as bombs, grenades and mines, comprising:

a transport container capable of being mounted at the aircraft;

said transport container being provided with at least one object mounted therein and intended to be dropped from the aircraft;

said transport container having an inner circumference;

at least three guide rails arranged about said inner circumference and spaced from each other by an angle of approximately 120°;

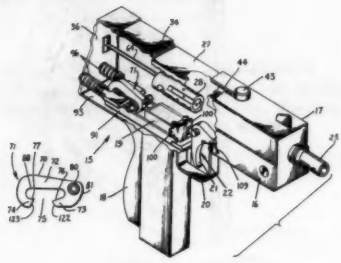
one of said guide rails being located so as to extend essentially normally relative to a substantially horizontal flight direction of the aircraft; and

means for applying to the object mounted internally of the transport container, at least during one time interval prior to dropping such object and at least partially thereat, a flight-pressure head of the aircraft.

4,522,105
FIRING MECHANISM FOR SEMIAUTOMATIC FIREARMS

Maxwell G. Atchisson, Doraville, Ga., assignor to SW Daniel, Inc., Atlanta, Ga.

Filed Jun. 6, 1983, Ser. No. 501,705
Int. Cl.³ F41C *19/00*
U.S. Cl. 89—139 **12 Claims**



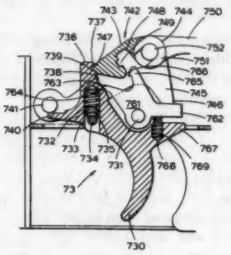
1. Firing mechanism for a firearm, comprising:
hammer means movable along a path including a firing position and a cocked position;
means biasing said hammer means for pivotal movement toward the firing position;
said hammer means having first and second confronting surfaces defining an opening in the hammer means, and having primary and secondary sear engaging surfaces, said primary sear engaging surface adjacent said first confronting surface, said secondary sear engaging surface adjacent said second confronting surface, said primary and secondary sear engaging surfaces positioned in mutually spaced apart relation across said opening;
sear means disposed between said primary and secondary sear engaging surfaces, and selectably movable between a first position and a second position;
said sear means having a primary sear surface located for engagement by said primary sear engaging surface as said hammer means is moved to the cocked position, so as to retain the hammer means in the cocked position when the sear means is in said first position;
said sear means having a secondary sear surface located for engagement by said secondary sear engaging surface as said hammer means is pivoted beyond the cocked position, with said sear means moved to said second position so that the primary sear engaging surface cannot engage the sear means, thereby retaining the hammer means behind the cocked position; and
said primary and secondary sear surfaces being located on said sear means so that said hammer means pivots to be retained at the cocked position by said primary sear surface when the sear means returns to the first position, thereby maintaining said hammer means ready to pivot to the firing position when said sear means next is moved to the second position.

4,522,106
GUN HAMMER MECHANISM

James L. Sullivan, Costa Mesa, Calif., assignor to Chartered Industries of Singapore Private Limited, Jurong Town, Singapore

Filed Oct. 25, 1982, Ser. No. 436,383
Claims priority, application United Kingdom, Oct. 30, 1981, 8132812
Int. Cl.³ F41C *5/00, 19/00*; F41D *11/02*
U.S. Cl. 89—140 **10 Claims**

1. An automatic or semi-automatic gun having a reciprocable bolt means and a hammer mechanism which comprises a hammer connected to rotate about a pivot, a firing pin striking surface on the hammer, and a pivot about which a pivotable strut moves, said pivot for the strut being on a side of the hammer firing pin striking surface which is remote from the hammer pivot, a bias means for urging the strut toward a firing position, the strut being arranged to be contacted by the bolt

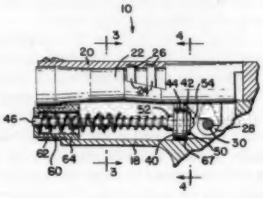


means to permit the bolt means to travel entirely rearwardly of the hammer to thereby cock the hammer, the strut holding the hammer out of the forward path of the bolt means to enable the bolt means to travel forwardly and thereby strip and chamber a cartridge.

4,522,107
SHOCK-ABSORBING RECOIL MECHANISM

Sidney H. Woodcock; Michel E. Maes, both of Bellevue, and Ronald W. Steimel, Mountlake Terrace, all of Wash., assignors to Detonics Pistol Accessories Ltd., Bellevue, Wash.

Filed Sep. 3, 1981, Ser. No. 299,000
Int. Cl.³ F41D *11/12*
U.S. Cl. 89—196 **15 Claims**



1. In a semiautomatic firearm having an elongated frame including a generally U-shaped cavity with an upwardly facing opening and a shoulder formed along the sidewalls toward the rear thereof, an elongated barrel mounted on said frame and at least partially restrained from movement therewith, an elongated slide mounted on said frame and surrounding said barrel, said slide being adapted to slide along said frame between a battery position and a recoil position, a recoil spring assembly resiliently biasing said slide toward its battery position, said assembly including an elongated spring guide extending between said frame and said slide, and a recoil spring extending rearwardly from a forward portion of said slide to a portion of said frame near said shoulder, and a shock-absorbing assembly comprising a sheet of resilient material positioned between a pair of plates, said sheet and plates having a shape corresponding to that of said U-shaped cavity, said sheet and plates being placed in said cavity with one of said plates abutting said shoulder, the material forming said resilient sheet having a low coefficient of friction and the transverse dimension of said resilient sheet being slightly larger than the transverse dimensions of said plates so that the lower inside edges of said slide contact said resilient sheet instead of said plates, whereby said slide engages the other of said plates when moving to its recoil position, thereby compressing said resilient sheet to absorb the

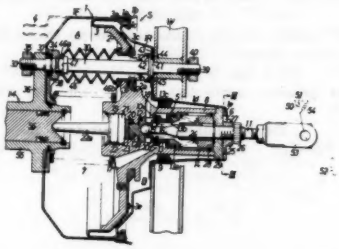
recoil force of said slide against said frame, and whereby said resilient sheet spaces said plates from said slide.

4,522,108

VACUUM BOOSTER DEVICE

Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Mar. 11, 1981, Ser. No. 242,701
Claims priority, application Japan, Sep. 12, 1980, 55-126996
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—376 R **2 Claims**



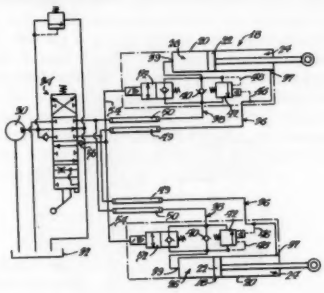
1. A vacuum booster device comprising a booster shell having a front wall and a rear wall, an axially slideable booster piston accommodated in the booster shell, a first working chamber defined in the booster shell by said front wall and the booster piston and held in communication with source of vacuum supply, a second working chamber defined in the booster shell by said rear wall and the booster piston and slectively placed in communication with the first working chamber or the external atmosphere through a control valve means, an input rod arranged opposite the booster piston for movement toward and away from the latter and connected to the control valve means so as to produce a pressure difference between both the working chambers effective to cause the booster piston to follow forward movement of the input rod, tie rods extending through the booster piston interconnecting said front and rear walls of the booster shell and passing through a through hole in said piston, flexible bellows surrounding each of the tie rods and having opposite ends fixed to an end of the tie rod adjacent said front wall and around said opening in the booster piston, respectively, so that the inside of the flexible bellows communicates continuously with the second working chamber, an adjustable stop means provided on the input rod for defining a retraction limit of the latter so as to create a pressure difference between said first and second working chambers when the input rod is in it is full-retreated position and the control valve means is held in a neutral postion keeping the second working chamber cut off from its communication with both the first working chamber and external atmosphere so that the bellows becomes expansive owing to said pressure difference between the working chambers, a piston diaphragm which cooperates with said booster piston to divide the interior of said booster housing into said first and second working chambers, said flexible bellows having a rear end tightly fixed to said through hole of the booster piston while said piston diaphragm having a through hole for said tie rod passing therethrough, and an annular bead being integrally formed around a peripheral edge of said through hole of the piston diaphragm, which annular bead has it front surface separably mated with said rear end of the flexible bellows to provide a seal to said through hole of the piston diaphragm.

4,522,109

LEAK-DETECTING HYDRAULIC SYSTEM

Gary C. Marchi, Burlington, and Richard H. Logan, West Burlington, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Nov. 21, 1983, Ser. No. 553,692
Int. Cl.³ F15B *11/08, 13/04*
U.S. Cl. 91—420 **5 Claims**



1. A leak-detecting hydraulic system for selectively operating a fluid actuator having first and second opposing expansible chambers, comprising:

selectively operable, multi-position control valve means for directing pressurized hydraulic fluid to a selected one of said chambers while receiving fluid from the other of said chambers;

first fluid passage means joining said first chamber and said control valve means in fluid communication; and

second fluid passage means for joining said second chamber and said control valve means in fluid communication, said second passage means including leak-detection circuit means comprising one-way valve means for permitting pressurized fluid flow into said second chamber while preventing reverse fluid flow through said one-way valve means, and counterbalanced valve means arranged in parallel flow relation with said one-way valve means, first and second pressure-sensing lines respectively joining, in pressure-sensing relation said first fluid passage means and said second expansible chamber with said counterbalanced valve means, said counterbalanced valve means including biasing means acting in opposition to said first and second pressure-sensing lines, whereby said leak-detection circuit means being adapted to permit pressurized fluid flow from said valve means to said second chamber via said circuit means, and being further adapted to prevent fluid flow from said second chamber via said circuit means unless said first fluid passage means is pressurized with fluid.

4,522,110

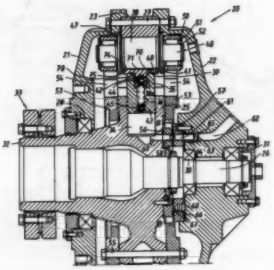
HYDRAULIC RADIAL PISTON MOTOR

Einar Samuelsson, Örnsköldsvik, Sweden, assignor to AB Hägglund & Söner, Mellansel, Sweden

Filed Sep. 6, 1983, Ser. No. 529,647
Claims priority, application Sweden, Sep. 8, 1982, 8205097
Int. Cl.³ F01B *13/06, 31/00*
U.S. Cl. 91—488 **18 Claims**

1. In a hydraulic radial piston motor which includes a housing; a cam disc which has an internal cam surface; a cylinder block havng a plurality of radially disposed cylinders; a plurality of pistons, a respective piston being slidably disposed in a respective cylinder; a plurality of roller cages, each roller cage being located between a respective piston and the cam disc, and each roller cage including an outer bearing surface which is shaped as part of the internal surface of a cylinder; two guide

units fixedly joined to the cylinder block, each guide unit including radially inwardly directed guide slots, the guide slots being in register on opposite sides of each respective roller cage; a plurality of cam-follower rollers, each cam-follower roller being located in a respective roller cage and having an outer surface which rolls against the internal cam surface of the cam disc, each cam-follower roller including a shaft pin at its opposite ends which mount respective guide bearings, the respective guide bearings being movable in the associated guide slots of the guide units and transmitting tangential forces



that act on the cam-follower rollers to the guide units and thus to the cylinder block, the improvement wherein

each roller cage and associated piston are separate elements which are movable with respect to one another, each roller cage having an inner bearing surface and each piston having an outer bearing surface constructed such that angular motions therebetween are possible in all directions, and

each roller cage includes a hydrostatic bearing which cooperates with the outer surface of the associated cam-follower roller.

4,522,111

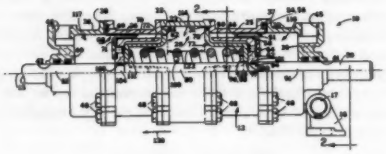
DOUBLE-ACTING, FLUID ACTUATED POSITIONING ACTUATOR

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed Sep. 13, 1982, Ser. No. 417,462

Int. Cl.³ F01B *19/00*

U.S. Cl. 92—48 **12 Claims**



1. A double-acting positioning actuator having: a hollow cylindrical housing; an actuating rod passing through the housing and being mounted for axial movement relative to the housing along a cylinder axis; first and second partition means cooperating with the actuating rod for axial movement therewith and for defining and separating a spring chamber and first and second actuating chambers spaced apart at opposite ends of the spring chamber within the housing; the rod and partition means being sealed relative to the chambers; a compression spring means having first and second ends and being mounted within the spring chamber; a fluid port in each actuation chamber to communicate with a pressurized fluid supply, the actuator being further characterized by:

(a) first and second retaining means fitted within the spring chamber and cooperating with the first and second ends of the spring means respectively, each retaining means having a respective stop means,

(b) the spring chamber having a limiting means having opposed shoulders adapted to cooperate with the stop means of the retaining means to hold the stop means spaced apart at a particular spacing when the actuator is centered, the limiting means providing a clearance extending axially between the opposed shoulders to receive the stop means therein so as to permit limited axial movement of one of the stop means relative to the housing and the remaining stop means during a stroke of the actuating rod, the stroke being no greater than the particular spacing between the stop means when the actuator is centered.

4,522,112

SWASH-PLATE TYPE COMPRESSOR HAVING IMPROVED LUBRICATION OF SWASH PLATE AND SHOES

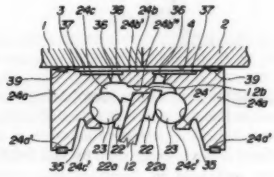
Hiroshi Nomura, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,615

Claims priority, application Japan, Apr. 26, 1982, 57-60804[U]

Int. Cl.³ F01M *1/06;* **F04B** *1/16*

U.S. Cl. 92—71 **6 Claims**



1. A swash-plate type compressor comprising:

a cylinder block having at least one cylinder bore extending axially thereof and having an inner peripheral surface;

a swash-plate arranged in said cylinder block and rotatable relative thereto, said swash plate including an outer fringe having opposite side surfaces;

at least one double-headed piston slidably received within said cylinder bore and having an outer peripheral surface, said piston including a pair of heads, each head having an inner end face, and an intermediate bridge portion intervening between said heads, said intermediate bridge portion having a first side surface forming part of said outer peripheral surface of said piston and facing said inner peripheral surface of said cylinder bore, and a second inner side surface opposite to said first side surface and facing said outer fringe of said swash plate;

said second side surface of said intermediate bridge portion defining a recess in cooperation with opposite inner end faces of said heads; and

at least two pairs of shoe and ball assemblies interposed between said piston and said outer fringe of said swash plate and maintaining said swash plate in rotatable engagement with said piston, each of said shoe and ball assemblies including a shoe disposed in slidable contact with a corresponding one of said opposite side surfaces of said outer fringe of said swash plate and a ball disposed in slidable contact with said piston and maintaining said shoe on said corresponding one of said opposite side surfaces;

said intermediate bridge portion of said piston having at least one lubricating oil-guiding hole extending therethrough from said first side surface to said second inner side surface for guiding lubricating oil from said first side surface to said second inner side surface;

said recess receiving therein said outer fringe of said swash plate and said shoe and ball assemblies;

said lubricating oil-guiding hole opening in said recess for guiding lubricating oil to the inner side surface of said bridge portion, to at least said outer fringe of said swash plate and to said shoe and ball assemblies;

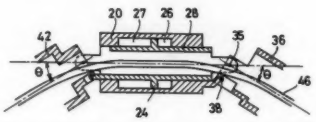
a lubricating oil-guiding groove formed in said first side surface of said intermediate bridge portion of said piston, said lubricating oil-guiding groove extending axially of said piston and having one end joining said lubricating oil-guiding hole, said lubricating oil-guiding groove having another end and gradually increasing in width toward said another end thereof.

4,522,113

DEVICE FOR ACCOMMODATING BENDING OF A CABLE

Koichi Tsuno, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 2, 1984, Ser. No. 576,101
Claims priority, application Japan, Feb. 12, 1983, 58-22481
Int. Cl.³ F16J *15/18*
U.S. Cl. 92—113 **2 Claims**



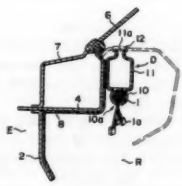
1. A remote-controlled device for accommodating bending an elongated object such as a cable, said device comprising a double-acting cylinder having a piston rod slidably mounted in said cylinder, a first holder pivotally coupled by a first coupling pin to one end of said piston rod so as to be pivotable around said first coupling pin, said first holder being pivotally coupled with some play to one end of said cylinder by a second coupling pin so as to be pivotable around said second coupling pin, said second coupling pin being parallel to and spaced at a distance from said first coupling pin, and a second holder pivotally coupled to the other end of said cylinder by a third coupling pin so as to be pivotable around said third coupling pin, and said second holder being pivotally coupled with some play to the other end of said piston rod by a fourth coupling pin so as to be pivotable around said fourth coupling pin, said fourth coupling pin being parallel to and offset at a distance from said third coupling pin.

4,522,114

AIR DUCT ASSEMBLY

Yoshio Matsuno, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 10, 1983, Ser. No. 474,823
Claims priority, application Japan, Apr. 12, 1982, 57-59703
Int. Cl.³ F16L *17/12, 55/00*
U.S. Cl. 98—2.09 **1 Claim**



1. In an automobile having a passenger compartment, an air duct assembly, comprising:

a harness;

a defroster duct molded of a plastic material, said defroster duct being disposed at a forward part of said passenger compartment, extending transversely across said automobile, and having a bottom; and

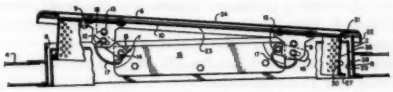
a harness sheath provided at said bottom of said defroster duct, said harness sheath being molded of said plastic material integrally with said defroster duct and having a wall formed with a laterally openable, longitudinal slit, said harness sheath being sufficiently flexible such that when said harness is placed in substantially aligned contact with said slit and is forced into said sheath through said slit, said wall of the sheath is flexed such that said slit is laterally opened to permit the harness to pass through said slit into said sheath, and the harness being received in said sheath, is covered over a substantial length by said sheath so that said sheath serves as a protector for the harness to prevent the harness from coming into contact with neighboring components when the body of the motor vehicle vibrates, thereby preventing the possibility of fire due to breakage of an insulator coating of said harness.

4,522,115

VENTILATOR FOR VEHICLE

Timothy A. Kelly, and Rueben M. Turbyfill, both of Salem, Va., assignors to Ventilator Associates, Salem, Va.

Filed Jul. 29, 1983, Ser. No. 518,661
Int. Cl.³ B60H *1/26*
U.S. Cl. 98—2.14 **13 Claims**



1. A ventilator for a roof or other wall of a vehicle, comprising a frame mounted on and bounding an opening in said wall, a closure member, spring-and-link assemblies connecting said closure member at opposite sides to corresponding sides of said frame, said assemblies each including a pair of pin means each mounted on a different of said frame and closure member, and spring means and link means each connecting adjacent opposite ends to and acting between said pair of pin means for enabling said closure member to be moved against yieldable resistance between closed and any of a plurality of open positions.

4,522,116

SELECTIVE ZONE ISOLATION FOR HVAC SYSTEM

Jerry J. Tartaglino, 4911 W. Hanover, Dallas, Tex. 75209

Filed Mar. 12, 1984, Ser. No. 588,443
Int. Cl.³ F24F *11/00*
U.S. Cl. 98—39.1 **1 Claim**

1. Apparatus for opening and closing an air flow duct comprising, in combination:

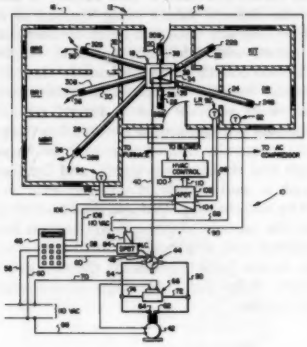
an inflatable air bladder for insertion into the air flow duct, said bladder being adapted to close the air flow duct when expanded, and to open the air flow duct when deflated;

an air compressor having inlet and discharge ports;

switching valve means coupling said compressor in fluid communication with said inflatable air bladder, said switching valve means having a first operating mode in which the discharge port is coupled to said inflatable bladder and the compressor inlet port is open to draw ambient air, and having a second operating mode in which the compressor inlet port is coupled to said bladder for drawing air therefrom with the compressor discharge port being open to ambient air; and,

pressure responsive power switching means for applying operating power to said compressor in response to the compressor discharge port pressure being less than a first pressure level corresponding with said bladder being in

the expanded, duct closed condition, and for removing operating power from said compressor in response to the



compressor inlet port pressure being less than a second pressure level corresponding with said bladder being in the collapsed, duct open condition.

4,522,117

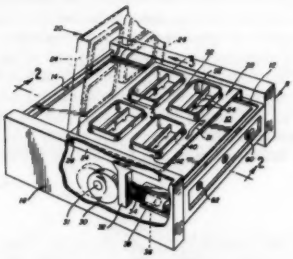
APPARATUS FOR PREPARING SCRAMBLED EGGS

Ralph E. Weimer, Lombard; Thaddeus J. Kalowski, Lisle, and Robert A. Novy, LaGrange Park, all of Ill., assignors to Restaurant Technology, Inc., Oakbrook, Ill.

Continuation-in-part of Ser. No. 355,687, Mar. 8, 1982, Pat. No. 4,433,001. This application Nov. 7, 1983, Ser. No. 549,279

Int. Cl.³ A47J *29/00*

U.S. Cl. 99—348 **16 Claims**



1. Apparatus for producing scrambled eggs comprising a grill having a grill surface and means for heating said grill surface,

a frame adjacent said grill,

a carriage mounted on said frame,

at least two egg rings mounted on said carriage, said egg rings each having a lower edge portion adapted to be disposed in intimate contact with said grill surface and for movement therealong, thereby to define with said grill surface an enclosed region within each egg ring, and

motor means on said frame operatively connected to said carriage for rapidly reciprocating said carriage and said egg rings to and fro in a reciprocating mode along said grill surface, and wherein said reciprocating means comprises means for automatically reciprocating said carriage and said egg rings at a first rate for a first portion of said rapid movement and at a second faster rate during a second portion of said rapid movement.

whereby liquid eggs disposed in said egg rings on said grill are adapted to be confined in said egg rings and are adapted to be moved to and fro and scrambled on said grill surface.

4,522,118

VACUUM AGITATOR FOR MEAT PRODUCTS

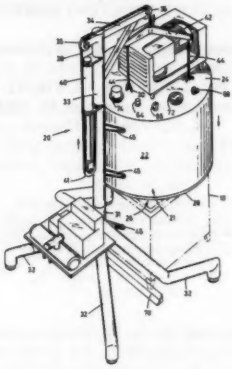
Knud Simonsen, P.O. Box 4, Nobleton, Ontario, and Mirek Holan, 50 Panorama Ct., #1509, Rexdale, Ontario, both of Canada

Filed Feb. 19, 1982, Ser. No. 350,342

Claims priority, application Canada, Feb. 23, 1981, 371477

Int. Cl.³ A23B *4/02*; B01F *7/16*

U.S. Cl. 99—472 **12 Claims**



1. Vacuum processing apparatus for use in combination with a container of predetermined width and height, and having a bottom wall, side walls and an open top, said apparatus comprising;

a vacuum chamber having an open bottom, side walls and a closed top, said chamber being of a width and height greater than said container to receive said container therein, and the height of such chamber being sufficient to fit completely over said oven top of and said side walls of said container with said open top and side walls freely enclosed therewith in;

stirring means within said chamber extending downwardly into said container through said open top;

power operated means for rotating said stirring means whereby the contents of said container may be stirred;

sealing means around said open bottom of said chamber whereby to hermetically enclose said container;

means for raising and lowering said chamber relative to said container, and,

means for evacuating the atmosphere within said chamber around the exterior of, and within said container.

4,522,119

OLIVE OIL RECOVERY

Harvey E. Finch, Foster City, and Salvatore P. Trapanese, Millbrae, both of Calif., assignors to FPS Development Partnership, Sacramento, Calif.

Division of Ser. No. 345,554, Feb. 4, 1982, Pat. No. 4,452,744, which is a continuation-in-part of Ser. No. 220,170, Dec. 23, 1980, Pat. No. 4,370,274. This application Apr. 13, 1984, Ser. No. 600,134

Int. Cl.³ A23N *1/00*

U.S. Cl. 99—483 **13 Claims**

1. An apparatus for recovering olive oil from olives comprising:

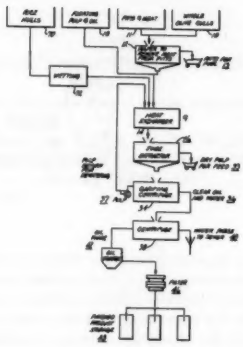
means for separating olive pits from olives to obtain a pitless olive meat;

means for mixing an inert additive with the pitless olive meat;

heat exchange means for heating the mixture to a temperature between at least about 80° F. and no more than about 110° F.;

means for introducing the additive and pitless olive meat to an extraction zone;

means for withdrawing a liquid phase comprising water,



olive oil, and a minor proportion of olive pulp from a first portion of the extraction zone;

means for withdrawing a substantially dry solid olive pulp from a second portion of the extraction zone;

means for separating the minor proportion of olive pulp from the liquid phase for obtaining a mixture comprising olive oil and water; and

means for separating water from the mixture for obtaining an olive oil substantially free of water.

4,522,120

BALE LENGTH CONTROLLING SPROCKET FOR BALING MACHINES

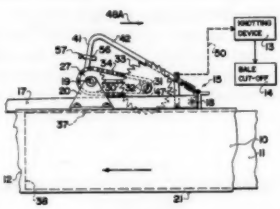
Abram J. Olfert, Box 7, Hague, Saskatchewan, Calif.X (S0K 1X0)

Filed Oct. 7, 1983, Ser. No. 539,941

Claims priority, application Canada, Oct. 7, 1982, 413072

Int. Cl.³ B65B *13/26*

U.S. Cl. 100—4 **3 Claims**



1. In a baling machine which includes a bale discharge chute having an intake end and a discharge end, a bale knotting device and cutoff device operatively connected to the knotting device and actuated thereby; the improvement comprising a star wheel located in said chute for gauging the length of the bale prior to cutting off same, said star wheel being operatively connected to the knotting device, means on said chute mounting said star wheel for floating contact with the upper surface of a bale being formed and passing through said chute, said means including further means to maintain substantially constant contact and pressure of said star wheel upon said upper surface of said bale, said means mounting said star wheel and said further means to maintain substantially constant contact and pressure of said star wheel including a mounting bracket, a shaft supported upon said chute and extending transversely thereacross for pivotally supporting said mounting bracket by one end thereof to the upper side of said chute and extending longitudinally of said chute towards the discharge end thereof, means mounting said star wheel for free rotation adjacent the distal end of said bracket, spring means reacting between said bracket and said chute to maintain a relatively constant downward pressure of said star wheel when engaging the upper surface of said bale, means actuated by said star wheel for measuring the rotation of said star wheel and further means operatively connecting said last mentioned means to the knotting device for actuating same, said means actuated by said star wheel for measuring the rotation thereof, including a chain and sprocket assembly operatively extending between said star wheel and said shaft, to rotate said shaft, a pulley secured to said shaft, said pulley having a root surface, the root surface of said pulley being serrated, an actuated lever mounted upon said chute, said lever including a substantially vertical portion having an edge engageable with the serrated root surface of said pulley and a mounting portion extending from the upper end of said substantially vertical portion, means to maintain the engagement of said edge of said substantially vertical portion, with the serrated root surface of said pulley, a recessed portion formed on the lower end of said substantially vertical portion engaging with said root surface of said pulley when said recessed portion reaches said pulley thereby end shifting said actuating lever, means pivotally mounting said actuating lever adjacent the distal end of said mounting portion of said end shifting of said actuating lever, said knotting device being actuated when said recessed portion of said actuating lever engages said pulley, and means to adjust the initial position of said substantially vertical portion relative to said pulley to control the timing of the engagement of said recessed portion with said pulley and hence the timing of the actuation of said knotting device and hence the actuation of said knotting device.

4,522,121

CHASSIS FOR A FRANKING OR POSTAGE METERING MACHINE

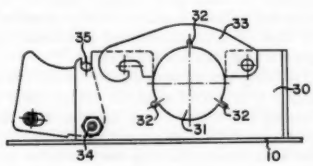
Horst Denzin, and Horst Päch, both of Berlin, Fed. Rep. of Germany, assignors to Francotyp Gesellschaft mbH, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 358,872, Mar. 16, 1982, abandoned. This application Jan. 19, 1984, Ser. No. 572,594

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 8108924[U]

Int. Cl.³ B41F *1/26*

U.S. Cl. 101—92 **4 Claims**



1. Chassis for postage metering machines having a printing-cylinder shaft supported by ball bearings, comprising a base plate, a U-shaped frame carried by said base plate and formed with two similarly shaped one-piece legs and a cross piece inter-connecting said legs, the U-shaped frame having a side closed by said cross piece and an open side opposite said closed side, one-piece retaining brackets fastened to said legs at each end of said retaining brackets and pivotable about one of said ends, said legs and brackets together having holes formed

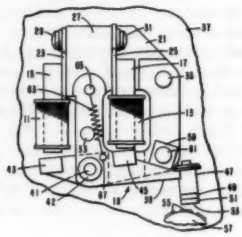
therein for completely surrounding the printing-cylinder shaft and for accommodating the ball bearings of the printing-cylinder shaft, a peripheral edge defining said holes in said legs and brackets being formed with blind incisions elongated in different directions for receiving therein means for vertically and horizontally adjusting the ball bearings in said holes, a first rod connecting said legs to one another across said open side of the U-shaped frame for mutually bracing said legs, a plurality of plates spaced along the length of said first rod and extending from one of said legs to the other and serving as carrying elements for subassemblies, said plates being supported for rotation by said first rod a second rod, carried by said plates, and pivotable into and out of said frame together with said plates about said first rod, and spacer sleeves intermediate adjacent ones of said plates being coaxially mounted on each of said rods for fixing said plates in mutually spaced relationship.

4,522,122

FAST IMPACT HAMMER FOR HIGH SPEED PRINTER

Ali T. Mazumder, Waterloo, Canada, assignor to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed May 3, 1983, Ser. No. 491,117
Int. Cl.³ B41J *9/42*
U.S. Cl. 101—93.02 **16 Claims**



1. An impact hammer assembly for a high speed printer, said assembly comprising:

a print hammer having a hammer head, a first portion, and a second portion located between said hammer head and said first portion, said print hammer being movably mounted at a pivot point between said first and second portions for movement between a rest position and a print position;

a first core of magnetic material disposed adjacent to and spaced from said first portion;

a first winding wound around said first core and being responsive to a first pulse for magnetically attracting said first portion to cause said hammer head to be impelled from the rest position toward the print position;

a second core of magnetic material positioned adjacent to and spaced from said second portion;

a second winding wound around said second core and being responsive to a second pulse for magnetically attracting said second portion to cause said hammer head to be impelled toward the rest position; and

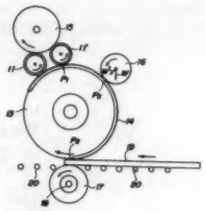
means for selectively generating the first pulse for said first winding during a first preselected period of time starting when said hammer head is substantially at the rest position and ending before said hammer head reaches the print position and generating the second pulse for said second winding during a second preselected period of time starting after said hammer head has rebounded from the print position and ending before said hammer head reaches the rest position, said generating means including first circuit means for developing the first pulse for said first winding and second circuit means for developing the second pulse for said second winding.

4,522,123

PINHOLE REMOVAL DEVICE IN PRINTING

Katsutoshi Matsumoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kamikyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,523
Claims priority, application Japan, Jul. 6, 1982, 57-118199
Int. Cl.³ B41F *31/00*
U.S. Cl. 101—349 **1 Claim**



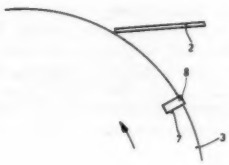
1. In printing apparatus having a rotary printing member, inking means contacting said printing member to create on said printing member an ink film to be transferred to an object to be printed, a device for preventing pinholes from forming in the ink transferred to the object comprising a leveling roller having an oil-repellant surface disposed in rolling contact with the ink film carried by the printing member, said leveling roller being mounted on an axis which is movable with respect to the axis of said rotary printing member, said leveling roller being effective to level the film of ink before it is transferred to the object.

4,522,124

INKING ROLLER FOR THE INKING EQUIPMENT OF A ROTARY PRESS

Rainer Burger, Augsburg; Gerhard Bitti, Mering, and Ingo Kobler, Anhausen, all of Fed. Rep. of Germany, assignors to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 521,652
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230119
Int. Cl.³ B41F *31/26*
U.S. Cl. 101—350 **10 Claims**



1. Inking system for a rotary printing machine having

an ink trough (1);

an ink roller (3) having a cylindrical surface;

a doctor blade (2) to control the amount of ink being picked up by the ink roller from the ink trough and positionable with respect to the roller to leave a small gap (5) between the edge of the doctor blade and the surface of the roller;

an ink transfer roller (4) located to receive ink from the ink roller (3);

and means for inhibiting collection of contaminating particles in the ink trough (1),

said means comprising,

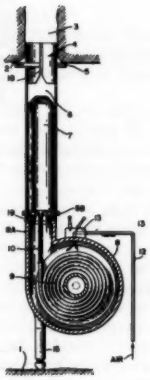
an elastic strip (8, 10) projecting from the cylindrical surface of the ink roller (3) and extending axially over the length of the roller, said strip (8, 10) projecting from the surface of the ink roller (3) by a distance of approximately the width of the gap, said elastic strip comprising a material which is soft with respect to the material forming the edge of the doctor blade, and which is elastically deformable to permit passage through a nip (6) formed between the ink roller (3) and the ink transfer roller (4).

4,522,125

CHARGING LARGE DIAMETER VERTICAL BOREHOLES

Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Filed May 7, 1984, Ser. No. 607,647
Claims priority, application Canada, Jun. 9, 1983, 430041
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—313 **3 Claims**



1. A method of charging an upwardly extending large diameter vertical borehole with a cylindrical explosive cartridge comprising the steps of providing a fluid-impervious flexible tubular element at the open end of said borehole, everting one end of said tubular element to form an inside-out face, mounting a base end of the said cylindrical cartridge against the said everted, tube face and applying pneumatic pressure within the said everted tube face to cause the tubular element to inflate longitudinally and to cause the everted tube face to travel along the said borehole pushing the said cylindrical cartridge before it to a selected location and thereafter withdrawing the inflated tube from the said borehole.

4,522,126

GUN LAUNCHED IR CLOAKING DEVICE FOR VEHICLES

Frank H. Bell, Logan, Utah, assignor to Morton Thiokol Inc., Chicago, Ill.

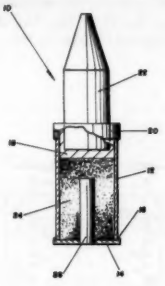
Filed Jan. 11, 1984, Ser. No. 569,803
Int. Cl.³ F42B *13/46*; G01J *1/00*
U.S. Cl. 102—370 **2 Claims**

1. A gun launched infrared cloaking device for vehicles, comprising:

a cartridge case including a frangible canister with sabot type obturation,

a solution including Aluminum Sulfate ($Al_2(SO_4)_3$) dissolved in a water carrier contained within said canister, and

a powder charge of a smokeless type contained within said cartridge case, said powder charge being just large enough when fired from a gun to cause gun ejection of the canister, canister rupture and nebulization of the solution



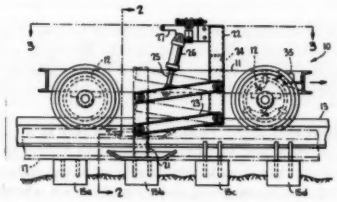
contained therein thereby to produce a mist around the vehicle that is impenetrable to infrared radiation.

4,522,127

RAILWAY TIE PLUG DRIVING APPARATUS

John R. Miller, and John L. Stubbs, both of Charlotte, N.C., assignors to Southern Railway Company, Washington, D.C.

Filed Mar. 7, 1983, Ser. No. 472,487
Int. Cl.³ E01B *31/26*
U.S. Cl. 104—17 R **4 Claims**

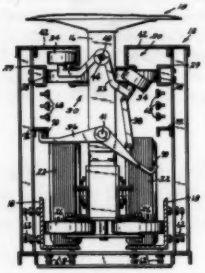


1. An apparatus for driving plugs into railway tie holes remaining after the removal of at least one rail and the associated tie plates and rail spikes thereof from railway ties of at least a section of a railway track, comprising a vehicle having a frame and wheels adapted for travel along the track, at least one vertically reciprocable tamper plate on one side of said frame for driving the plugs upon impact therewith, means for pivotally interconnecting said tamper plate with said frame, a pivotally mounted pneumatically operable piston and cylinder unit supporting said tamper plate from said vehicle frame for vertically reciprocating said tamper plate as the piston of said unit is extended and retracted, a split bracket having pivotally connected segments for supporting said unit from said frame, spring means acting between said segments for cushioning said tamper plate when making direct impacts against the railway ties, first limit switch means on said frame for extending said piston and lowering said tamper plate to drive the plugs, first means on said vehicle for actuating said first limit switch means at predetermined regular intervals, said first actuating means being mounted on one of said vehicle wheels for rotation together therewith about the wheel axis, second limit switch means on said vehicle frame for retracting said piston and elevating said tamper plate, and second means on said interconnecting means for actuating said second limit switch means at the end of each extension stroke of said piston, whereby said tamper plate is vertically reciprocated at said regular intervals for driving the plugs during movement of said vehicle along said rails.

4,522,128
SWITCH MECHANISM

J. Edward Anderson, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jan. 10, 1983, Ser. No. 456,860
Int. Cl.[3] E01B *25/12*
U.S. Cl. 104—130 6 Claims



1. A vehicle mounted switch mechanism for use in a transportation system having a wheeled vehicle having an attached support structure, said system having a fixed guideway with diverging switching sections, the switch mechanism comprising:

a first elongated upper switch arm attached in a pivoting relationship to said support structure and having first and second switch wheels rotatably affixed at the ends of said first switch arm, said first and second switch wheels having intersecting axes of rotation, said axes intersecting at an angle of between 10 and 60 degrees;

said first upper switch arm switchable between a first position and a second position; said first position placing said first switch wheel in engaging relation with a first switch channel located within said guideway and said second switch wheel distant from a second switch channel located within said guideway; said second position placing said second switch wheel in engaging relation with said second switch channel and said first switch wheel distant from said first switch channel;

said first position of said upper switch arm causing said vehicle to select a first path at said switching sections within said guideway, and said second position of said upper switch arm causing said vehicle to select a second path at said switching sections, said first upper switch arm having a generally "W" shape, having outer legs with ends and a central inverted "V" portion, said switch wheels affixed to said ends of said outer legs of said "W";

said first arm being attached at the apex of said inverted "V" portion, to said support structure so that a line passing from the point of engagement of said switch wheel with said switch channel through said apex will pass substantially perpendicularly through said switch channel; and

a first elongated lower switch arm affixed in pivoting relation near the midpoint of said first lower switch arm to said support structure below said first upper switch arm, and coupled to said first upper switch by a first slave link affixed to both said first upper and said first lower switch arms.

4,522,129
DEVICE FOR CHARGING DRILLHOLES

Leif Jerberyd, Handen, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed May 18, 1981, Ser. No. 264,556
Claims priority, application Sweden, May 28, 1980, 8003974
Int. Cl.[3] B66F *1/00*; H02G *1/08*
U.S. Cl. 104—138 G 5 Claims

1. Device for the introduction of explosive in the desired place in a drillhole, characterized by a climber, which climbs on the walls of the drillhole and is equipped with locomotion means powered from a fluid pressure source and designed to propel the climber in the desired direction in the drillhole, said locomotion means including fluid pressure actuated expansion means associated with the climber and designed to press against the walls of the hole as to stabilize the climber in the hole and prevent it from falling downwards therein, a main valve arrangement positioned rearwardly of the climber relative to its direction of travel as the climber enters the drillhole to introduce an explosive thereinto, and operative to control the supply of fluid under pressure to said locomotion means, and means for providing an explosive charge in the drillhole forwardly of said climber, said valve arrangement including means for selectively moving said climber forwardly and backwardly, respectively, in the drillhole, said climber comprises two parts capable of motion relative to each other, enabling the climber to alternately extend and contract in the direction of the drillhole while said expansion means press against the walls of the hole, and further characterized in that said two parts are diposed to be positioned one forwardly of the other in the drillhole with the front part of said two parts of the climber engaging said explosive charge, and wherein said front part has thereon means detachable from the other of said two parts of said climber, whereby said other part can be withdrawn from the drillhole and reused.

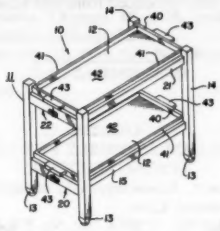
4,522,130
COLLAPSIBLE TEA CART

Roy Worthington, 327 Harbin, Waxahachie, Tex. 75165

Filed Apr. 1, 1983, Ser. No. 481,360
Int. Cl.[3] A47B *3/06*
U.S. Cl. 108—159 12 Claims

1. A foldable table comprising: a pair of oppositely disposed rigid side frame members each having an upwardly and inwardly opening longitudinal recess providing a tray edge support surface; foldable end assemblies connected between said side members for operation between a first folded condition wherein said side members are in close spaced substantially parallel relation with said end assemblies folded therebetween and a second extended condition wherein said side members are in farther apart spaced substantially parallel extended condition; and tray means engageable between said side

members on said supporting surfaces of said side members and between said end assemblies when said end assemblies are in



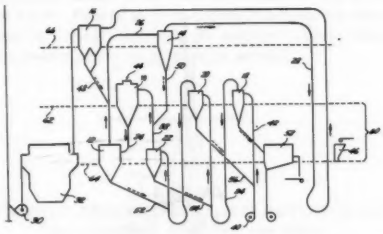
said extended condition, said tray means locking said side members in said extended condition and holding said end assemblies against folding.

4,522,131

INSTALLATION FOR THE THERMAL TREATMENT OF PULVERULENT MINERAL PRODUCTS

Jean Lebesgue, Avon, France, assignor to Fives-Cail Babcock, Paris, France

Filed May 4, 1984, Ser. No. 607,223
Claims priority, application France, May 10, 1983, 83 07754
Int. Cl.³ F23J *3/00*
U.S. Cl. 110—229 **3 Claims**



1. An installation for the thermal treatment of a pulverulent mineral product by gases, comprising

(a) a support frame having support means at a first level,

(b) a furnace for the thermal treatment of the pulverulent mineral product in suspension in hot gases generated by the combustion of air and a fuel,

(c) two groups of series-connected cyclones connected to the furnace, one of the groups of cyclones being arranged upstream of the furnace and the other group of cyclones being arranged downstream of the furnace, and

(d) conduit means connecting the cyclones to each other and to the furnace so that exhaust gases from the furnace pass successively through all the cyclones of the one group while a current of air passes through all the cyclones of the other group before entering the furnace to serve as the combustion air, the exhaust gases heating the product before it enters the furnace and the air current cooling the treated product, wherein the improvement comprises

(e) a superstructure affixed to the support frame and having support means at a second level higher than the first level,

(f) the furnace and two of the cyclones located, respectively, immediately upstream and immediately downstream of the furnace being mounted on the support means of the support frame at the first level, and

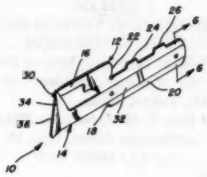
(g) at least some of the remaining cyclones being mounted on the support means of the superstructure at the higher level.

4,522,132

CUT/LOOP HOOK FOR TUFTING MACHINES

Ian Slattery, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Feb. 27, 1984, Ser. No. 583,688
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R **7 Claims**



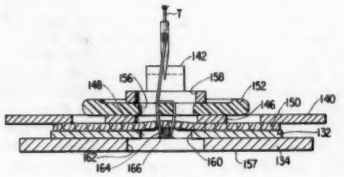
1. A combination cut/loop hook and clip for a tufting machine, said hook comprising a substantially planar body member including a blade and a shank, said blade extending forwardly from the shank and terminating at a loop seizing beak, an elongated mounting portion extending rearwardly from the shank for mounting within the tufting machine, a neck defining a reference surface formed at the rear of said blade above the shank and at least another reference surface formed on the upper edge of the mounting portion substantially normal to the neck, an elongated groove formed in one planar surface of the mounting portion, said clip comprising an elongated member having an enlargement at one end thereof and a substantially planar tail portion extending therefrom, at least a substantial part of said tail portion being of a width and thickness receivable within said groove so that a surface of said mounting portion within said groove and a surface of said part form corresponding abutting surfaces, and the opposite surface of said part forms a substantially smooth coplanar continuation of said planar surface, protuberence means defining at least one male formation on one of said corresponding abutting surfaces, recess means defining a like number of female formations in the other of said corresponding abutting surfaces, said female formations being of a size to cooperatively and securely receive a respective male formation, said enlargement having a crease disposed out of the plane of said tail and said groove and said formations being disposed such that said tail portion is spaced from said blade and said crease resiliently engages said beak.

4,522,133

FEED CONTROLLING ARRANGEMENT FOR BUTTON SEWING MACHINE

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 12, 1984, Ser. No. 660,168
Int. Cl.³ D05B *3/14*
U.S. Cl. 112—112 **5 Claims**



1. In a button sewing machine, a fabric supporting plate with a needle hole therein, means for clamping fabric and a button to the plate for movement thereby into positions wherein the button may be sewn to the fabric through spaced apart holes in the button, and a thread supporting tongue located on the plate

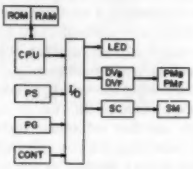
in a position to extend longitudinally in the needle hole into engagement with the underside of the clamped fabric and enable thread to be sewn under and across the tongue whereby the tongue is temporarily sewn to said fabric to prevent the fabric from slipping on the supporting plate during a button sewing operation.

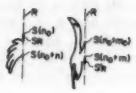
4,522,134

PATTERN GENERATING SYSTEM OF COMPUTER SEWING MACHINE

Susumu Hanyu; Hideaki Takenoya, both of Tokyo, and Shinichi Kato, Koganei, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,851
Claims priority, application Japan, Dec. 15, 1982, 57-218430
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—453 **1 Claim**





1. A pattern generating system of a computerized sewing machine, comprising:

a machine drive motor having a rotational speed;

a rotatable drive shaft having predetermined angular positions and rotated by said machine drive motor;

a needle for forming stitches and having positions including an upper dead point and a lower dead point;

a signal generator cooperating with said drive shaft to produce phase signals at said predetermined angular positions of said drive shaft to stop the sewing machine with said needle being held at either said upper dead point or said lower dead point;

a speed control circuit for controlling said rotational speed of said machine drive motor; and

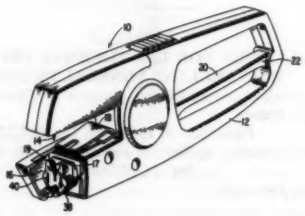
a microcomputer including program control means for controlling said speed control circuit, a memory for storing a plurality of groups of stitch control data each having an end and including a last group of stitch control data and feed control data, said groups of stitch control data being sequentially readout in a predetermined order in synchronism with the rotation of said drive shaft under control of said program means to thereby control said positions of said needle and feed positions for a predetermined number of patterns, said memory also having a first stop designating data group included at the end of each of said plurality of groups of stitch control data, except said last group of stitch control data, for stopping the sewing machine with said needle being held at said lower dead point, and a second stop designating data group included at the end of said last group of stitch control data, said program control means operating in synchronism with the rotation of said drive shaft to sequentially read out said plurality of groups of stitch control data and said first and second stop designating data groups, said speed control circuit receiving said first or second stop designating data group to stop the sewing machine with the needle being held at said upper or lower dead points respectively when one of said phase signals has been produced from said signal generator.

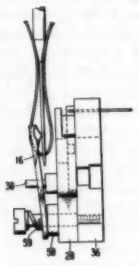
4,522,135

LOOPER AND CAM ASSEMBLY FOR CHAIN STITCH SEWING MACHINE

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 9, 1984, Ser. No. 578,449
Int. Cl.³ D05B *57/02, 97/02, 97/10*
U.S. Cl. 112—199 **5 Claims**





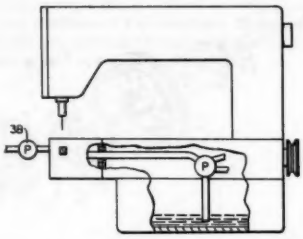
2. In a sewing machine; a needle; a frame; means mounted on the frame for reciprocating the needle; a looper and cam assembly, the looper being of a resiliently flexible material and being formed with a pair of loop seizing points, the cam including a pair of intersecting cam tracks and said cam having a gate pivotally mounted thereon; resilient means biasing the looper and cam assembly axially into a limited position in the frame; an actuator engageable with the cam on said cam tracks in the limited position of the assembly for imparting pivotal movement to said assembly and disposing the looper points for cooperation with the needle in the formation of chain stitches; and a spring having one end affixed within the frame and the other end engageable with the gate in the limited position of the cam for moving the gate into positions controlling actuator movement between the cam tracks; the looper being mounted on said cam to resiliently deflect away from the cam upon engagement of a loop seizing point with the needle, and leave the cam in its limited position wherein the cam tracks are engageable by the actuator and the gate is engageable by said spring, the cam being provided with axially projecting members which extend into sliding engagement with the looper from spaced apart locations on the cam to guide deflection of the looper while preventing pivotal movement thereof relative to the cam.

4,522,136

METHOD AND APPARATUS FOR RETARDING OIL LEAKAGE IN A SEWING MACHINE

James W. Wolff, Chicago; James W. Ruedisueli, Des Plaines, and Ralph Schinke, Chicago, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Dec. 1, 1983, Ser. No. 557,088
Int. Cl.³ D05B *71/00*
U.S. Cl. 112—256 **9 Claims**



1. A sewing machine having a frame whose interior contains lubricant, sealant means disposed substantially proximate a sewing zone and between the interior of said frame and the outside environment surrounding said frame, and means for retarding lubricant leakage through the sealant means and thereby avoiding its disposition onto a workpiece, comprising:

means independent of said sewing machine for removing a sufficient amount of air from the interior of said machine such that a flow of air from the machine's outside environment is inwardly drawn to the machine's interior through the sealant means to produce an air seal.

4,522,137

METHOD OF PRODUCING STITCH PATTERNS IN AN ELECTRONIC SEWING MACHINE

Hideaki Takenoya, Hachioji; Toshiro Fujimura, Musashino; Masanori Hara, and Yoshinobu Tonomura, both of Hachioji, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 70,048, Aug. 27, 1979, abandoned. This application Jul. 9, 1981, Ser. No. 281,895
Claims priority, application Japan, Aug. 29, 1978, 53-104363
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—266.1 **3 Claims**

1. A method of producing stitch data from which different complete patterns may be sewn by an electronic sewing machine, the method being designed to avoid wasted space in a read-only memory contained within the sewing machine by avoiding repetitious storage of stitch data therein, comprising the steps of:

dividing each of the different complete patterns to be sewn into individual unit patterns, which can be selectively combined to form at least one complete pattern;

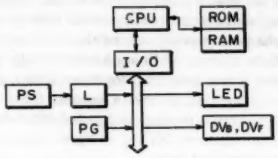
storing stitch data characteristic of the unit patterns in a read-only memory;

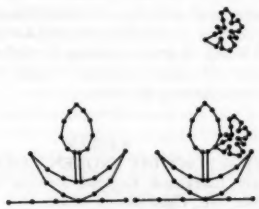
selecting one of the complete patterns to be sewn by actuating a pattern selecting switch;

ascertaining via a central processing unit which unit patterns are required for sewing the selected complete pattern;

ascertaining via the central processing unit an order in which such required unit patterns should be executed in sewing the selected complete pattern;

using the central processing unit to read stitch data characteristic of such required unit patterns into a random-access memory in said order; and





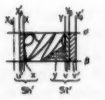
using the central processing unit to read stitch data out of the random-access memory in said order.

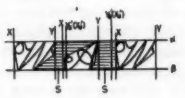
4,522,138

METHOD OF PREPARING INTERCHARACTER CONTROL DATA FOR USE IN SEWING MACHINES

Hideaki Takenoya, and Mikio Inamori, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 613,094
Claims priority, application Japan, May 24, 1983, 58-89931
Int. Cl.³ D05C *5/04*
U.S. Cl. 112—266.1 **1 Claim**





1. A method of preparing intercharacter control data for use in combination with an electronic sewing machine for controlling a needle position and a fabric feed amount to produce a series of character patterns, which comprises the steps of:

providing the intercharacter control data, each of which being composed of a first stitch control data group for producing an initial stitch to determine the position of a character relative to a fabric in which the character is stitched, a second stitch control data group for forming the character and a third stitch control data group for producing stitches to determine a spacing between the character and the next character to be stitched adjacent thereto, said first, second and third stitch control data group being provided in relation with a top segment (α) and a bottom segment (β) respectively passing the top and bottom ends of the character in parallel with the fabric feeding direction, and a front segment (X) and a rear

segment (Y) respectively passing through the mostly projecting front and rear ends of the character at the right angles with the fabric feeding direction;

providing said first stitch control data group to produce the initial stitch at a position close to said front segment (X);

providing said second stitch control data group to produce said character having at least the front and rear contours, said front contour defining a substantially predetermined constant blank area (Sh') together with said top and bottom segments (α,β) and a second front segment (X_0') which is drawn passing said initial stitch in parallel with said front segment (X) and at right angles with the fabric feeding direction; and

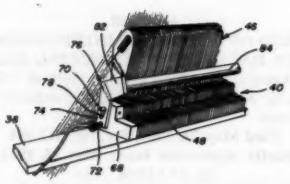
providing said third stitch control data group to produce said space determining stitches, the last stitch of which defining a substantially predetermined constant area (St') together with said top and bottom segments (α, β), said rear contour of the character and a second rear segment (Y_0') which is drawn passing through said last stitch in parallel with said rear segment (Y) and at right angles with the fabric feeding direction.

4,522,139

TUFTING MACHINE BROKEN YARN DETECTOR

Ian Beverly, Blackburn, England, assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Jul. 25, 1983, Ser. No. 516,971
Int. Cl.³ B65N *63/00, 69/36;* D05B *51/00*
U.S. Cl. 112—273 **11 Claims**



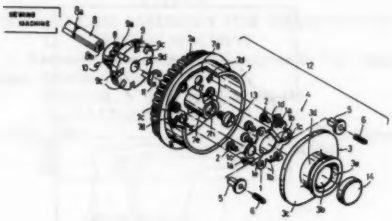
1. In a tufting machine having a multiplicity of yarn carrying needles mounted laterally across said machine and reciprocatably driven to penetrate a base material to insert loops of yarn therein, yarn feed means for feeding a yarn strand to each needle, apparatus intermediate said needles and said feed means for detecting a broken yarn, said apparatus comprising a frame supported on the tufting machine including a housing, a multiplicity of finger members, means for pivotably mounting said finger members in side-by-side relationship in said housing laterally across said machine, each of said fingers comprising a substantially flat member having planar laterally facing surfaces, means defining an eyelet extending through said surfaces for receiving a yarn strand such that each yarn strand may pass through a respective eyelet intermediate said feed means and a corresponding needle, said housing and fingers being disposed such that each finger is pivotably held in a raised position by a corresponding yarn strand and is pivotably dropped when the strand is broken, signal transmitting means mounted on said frame at a location beyond a first lateral extreme of said fingers beneath the raised position of said fingers for generating a signal, cooperating signal receiving means mounted on said frame at a location beyond the other lateral extreme of said fingers beneath the raised position of said fingers for receiving said signal when said fingers are in the raised position, said signal transmitting and receiving means being disposed such that the signal is interrupted by a finger when the corresponding yarn strand is broken and said finger drops, and locking means for holding substantially all of said fingers in a locked raised position for threading.

4,522,140

CLUTCH FOR SEWING MACHINE THREAD WINDING MECHANISM

Akio Koide, Kokubunji, Japan, assignor to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Feb. 6, 1984, Ser. No. 577,410
Claims priority, application Japan, Feb. 4, 1983, 58-14462[U]
Int. Cl.³ D05B *59/00*
U.S. Cl. 112—279 **4 Claims**



1. In a sewing machine having a main drive shaft rotated to vertically reciprocate a needle to penetrate a fabric for forming stitches thereon, a stop-motion mechanism comprising:

(a) a rotation transmission member secured near one end part of said main drive shaft and having a plurality of grooves formed thereon;

(b) a plulley rotated by driving means and having a knurled face applicable for thread winding operation and a central hollow axis, said pulley being secured to said end part of said main drive shaft and being prevented from axial movement but rotatable relative to said main drive shaft;

(c) an operating member rotatable together with said pulley but axially displaceable with respect to said pulley between two positions, one position being close to said pulley and the other being away from said pulley; and

(d) means for selectively transmitting rotation of said pulley to said rotation transmission member, said means being engaged with any of said grooves of said rotation transmission member so that rotation of said pulley is transmitted to said rotation transmission member for stitching operation, when said operating member is in the position close to said pulley, whereas said means being disengaged from said grooves so that said pulley alone is rotated for thread winding operation, when said operating member is in the position away from said pulley.

4,522,141

SHIPBOARD ICE LUBRICATION SYSTEM AND JET PUMP FOR USE THEREIN

Charles M. Aker, Lake Forest, Calif., assignor to Omnithruster, Inc., Sante Fe Springs, Calif.

Filed May 21, 1982, Ser. No. 380,522
Int. Cl.³ B63B *1/38*
U.S. Cl. 114—40 **4 Claims**

1. In combination with a ship having a hull and pump means for drawing water from the sea through an inlet in said hull, an ice lubrication system for facilitating the passage of said ship through ice laden water, said system comprising:

a first plurality of discharge openings formed in the starboard side of said hull below the chine of said ship and spaced from one another extending toward the stern from the bow portion of said hull;

a second plurality of discharge openings formed in the port side of said hull below the chine of said ship and spaced from one another extending toward the stern from the bow portion of said hull;

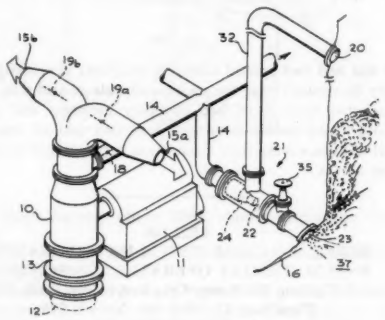
a plurality of jet pumps each having a water inlet, a gas inlet, and a gas/water outlet, each of said jet pumps being mounted in said hull with the gas/water outlet thereof adjacent to a different one of said discharge openings;

a gas source means including a plurality of air holes in the sides of said hull above said discharge openings and a plurality of air pipes each connecting a different one of said air holes to the gas inlet of a different one of said jet pumps; and

conduit means for coupling the outlet of said pump means to said jet pump water inlets for causing each of said jet pumps to produce a gas/water mixture and discharge it through the discharge opening adjacent thereto;

each of said jet pumps comprising:

a pipe section having a throat defined between an upstream converging portion and a downstream diverging portion defining said gas/water outlet and wherein said gas inlet is proximate to said converging portion; and



a nozzle means including a converging nozzle mounted substantially concentrically within said pipe section for discharging a water flow therein proximate to said pipe section converging portion for producing a suction at said gas inlet to pull gas therethrough, said nozzle means including a vortex generating means mounted upstream from said converging nozzle for creating sufficient turbulence in the outer boundary of the water flow discharged therefrom to entrain in the water flow the gas pulled through said gas inlet; and

valve means associated with each of said jet pumps for selectively directing the water flow supplied thereto either to the gas/water outlet thereof or through the air pipe connected thereto for discharge through one of said air holes.

4,522,142

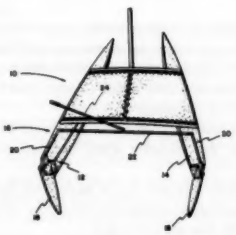
RUDDER-TILLER CONTROL SYSTEM FOR A BOAT

John W. Frye, Jr., Rte. 2, Box 99, Aberdeen, N.C. 28315

Continuation of Ser. No. 488,015, Apr. 25, 1983, abandoned. This application Sep. 14, 1984, Ser. No. 650,985

Int. Cl.³ B63H *25/06*

U.S. Cl. 114—163 **10 Claims**



1. In a multi-hull boat having a plurality of rudders secured thereto, a rudder-tiller arm associated with each rudder and extending therefrom, a tiller connector bar operatively interconnecting said rudder tiller arms, a tiller handle connecting to said tiller connector bar and extending therefrom, the improvement comprising a connector assembly for interconnecting selected rudder-tiller arms with said tiller connector bar for allowing rotation about a primary axis but which also allows said primary axis to move both laterally back and forth and fore-and-aftly, giving rise to at least three degrees of freedom of movement provided by said connector assembly between a respective rudder-tiller arm and said tiller connector bar, said connector assembly comprising:

a housing structure;

a female receiving cavity formed in said housing structure;

a male ball joint rotatively confined within said female receiving cavity;

a connecting pin secured to said male ball joint and extending therefrom wherein said connecting pin forms said primary axis along the longitudinal axis thereof;

a conical cut out formed around the portion of said cavity through which said connecting pin extends; and

means for connecting said connecting pin of said connector assembly to a respective rudder-tiller arm and said housing structure of said connector assembly to said tiller connector bar wherein relative rotary movement may occur about the primary axis defined by said connecting pin while said connecting pin itself may move laterally back and forth or fore-and-aftly while the end of said tiller connector bar moves vertically through the rotation of said male ball joint within said female receiving cavity of said connector assembly.

4,522,143

FOLDING BOAT WITH BOW AND STERN SECTIONS

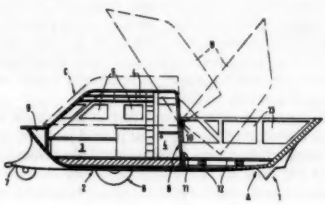
Siegfried Holzbaur, Stuttgart, Fed. Rep. of Germany, assignor to Carabo A.G., Glarus, Switzerland

Filed Jan. 31, 1983, Ser. No. 462,269

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202885

Int. Cl.³ B63B *7/00*

U.S. Cl. 114—344 **26 Claims**



1. A folding boat comprising:

a bow section having a front end and a rear wall;

a stern section privotally connected to said bow section and having a front wall and a rear end;

one of said bow section and said stern section forming a tilt-up section which is pivotally movable with respect to the other of said bow section and said stern section forming a mobile unit, between a folded-out position in which said front wall and said rear wall are in opposing relation to each other and a folded-up position in which said tilt-up section tilts over and is situated above the mobile unit, with said folding boat providing an enclosed living area;

undercarriage means on said mobile unit for permitting movement of said folding boat on land in said folded-up position; and

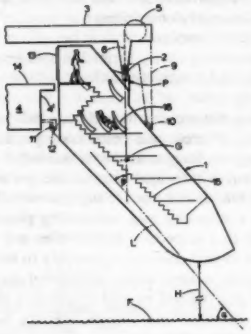
said rear wall and said front wall forming a doorway opening to said enclosed living area when said folding boat is in said folded-up position.

4,522,144

LIFE SAVING SYSTEM FOR MARINE STRUCTURE

Per G. Klem, Jar, Norway, assignor to Harding A/S, Rosendal, Norway

Continuation of Ser. No. 388,736, Jun. 15, 1982, abandoned. This application May 2, 1984, Ser. No. 605,993
Claims priority, application Norway, Jun. 30, 1981, 812231
Int. Cl.³ B63C *9/06*
U.S. Cl. 114—348 **5 Claims**



1. A free fall rescue system for use on a marine structure having a height of up to more than 20 meters, said system comprising:

an enclosed life boat having a bow, a stern, a center of gravity, a single fulcrum located above and aft of said center of gravity and a longitudinal axis;

means for suspending said life boat at said single fulcrum from the marine structure at a height of up to more than 20 meters over free water in an inclined position with said bow directed outwardly from the marine structure and downwardly and with said longitudinal axis extending with respect to the water surface at a first angle of approximately 40°–60° corresponding to a preferred angle of impact of said life boat therewith upon free fall vertically downwardly of said life boat from said inclined position;

said single fulcrum being located at a position on a line extending through said center of gravity and extending with respect to said longitudinal axis in said inclined position at a second angle substantially equal to an angle complementary to said first angle;

said suspending means supporting at said single fulcrum the entire weight of said life boat in said inclined position; and

said suspending means being selectively releasable to allow said life boat to fall freely vertically downwardly from said inclined position and to impact bow-first with the free water at said first angle.

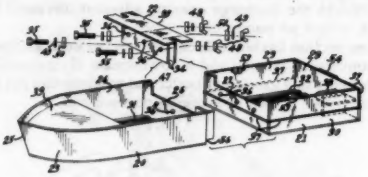
4,522,145

CONVERTIBLE BOAT AND LUGGAGE CARRIER

Selden A. Stone, 113A N. Lake Dr., Leesburg, Fla. 32788

Filed Nov. 21, 1983, Ser. No. 553,589
Int. Cl.³ B63B *7/04*
U.S. Cl. 114—352 **10 Claims**

1. In a combination boat and luggage carrier of two mating boat sections, one section being the bow section of the boat having an open top, two side walls converging to form the bow, a bottom, and a middle transverse wall, and the other section being the stern section having an open top, two side walls, a transom, and an aft transverse wall, said two sections forming an enclosed luggage carrier when their open tops are joined in face-to-face relationship; the improvement, which comprises said stern section being dimensioned to be nested substantially within said bow section when said open tops face each other and said transom is adjacent said bow and said bow section bottom is spaced above said stern section and the free edge of said stern section stern side walls being closely adjacent said bow section bottom, a three-sided socket formed by said side walls and said bottom of said bow section extending aft of said middle transverse wall and mating with said forward portion of said stern section when said bow and stern sections are aligned, and a transverse seat member including a horizontal seat and two spaced clamping members depending vertically downward from the underneath side of said seat, means connected to each of said clamping members and passing through said middle transverse wall and said aft transverse wall to form a watertight connection between said sections to form a boat.

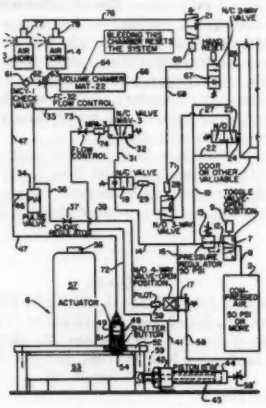


4,522,146

BURGLAR ALARM SYSTEM INCORPORATING PNEUMATICALLY OPERATED COMPONENTS

Heinz F. Carlson, 200 Kenny Crt., Santa Cruz, Calif. 95065

Filed Aug. 17, 1982, Ser. No. 409,016
Int. Cl.³ G03B *19/00*; G08B *1/04*
U.S. Cl. 116—2 **17 Claims**



1. A self-contained intruder alarm system that is independent of external energy sources for activation and which is adapted to be installed in a room or building into which an intruder may attempt to gain access and which is activated by an overt act by the intruder, comprising:

(a) camera means adapted to be activated by the system to photograph the intruder upon commission of the overt act;

(b) alarm means adapted to be activated by the system to sound an audible alarm as a result of the commission of the overt act by the intruder; and

(c) pneumatic circuit means cooperatively interconnecting said camera means and said alarm means and including a source of air under pressure and a valve actuated by the commission of said overt act by the intruder to activate

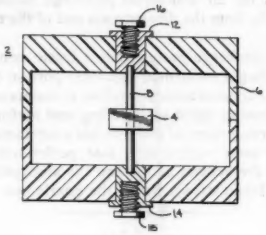
the circuit means to actuate the camera means and sound the audible alarm means.

4,522,147

SME SHUTTER MECHANISM

John W. Kroll, Greendale, and Roy Hyink, Wauwatosa, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 19, 1983, Ser. No. 533,247
Int. Cl.³ G01K *1/02*
U.S. Cl. 116—216 **3 Claims**



3. A shape memory effect, SME, shutter mechanism comprising:

a shutter movably mounted in a housing for actuation between given positions;

SME means in said housing for actuating said shutter in response to a given level of current flow through said SME means causing I^2R heating of the latter above its transition temperature;

terminal means in said housing for completing an electrical circuit through said SME means; wherein:

said shutter is mounted to said SME means and moved thereby between said given positions;

said SME means comprises a shaft mounted in said housing at its opposite ends;

said shutter is mounted on said shaft between said ends;

said terminal means engage said ends of said shaft;

said shaft rotates axially in response to I^2R heating thereof above said transition temperature;

said ends of said shaft are nonrotatably secured in said terminal means and said shaft torsionally rotates.

4,522,148

APPARATUS FOR COATING LIGHTGUIDE FIBER

Bahiru Kassahun, Roosevelt Township, Monmouth County, and Montri Viriyayuthakorn, Hamilton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 558,670, Dec. 6, 1983, which is a division of Ser. No. 418,317, Sep. 15, 1982, Pat. No. 4,439,467. This application May 29, 1984, Ser. No. 614,897
Int. Cl.³ B05C *3/12*
U.S. Cl. 118—405 **5 Claims**

1. An apparatus for coating an elongated material to provide a substantially bubble-free covering, said apparatus including:

reservoir means for holding a coating material;

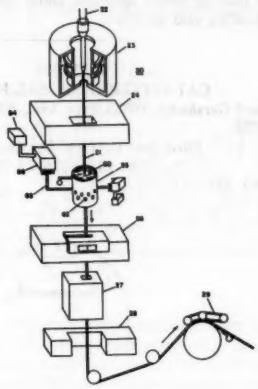
first die means communicating with said reservoir means and including an exit orifice at one end thereof;

second die means for sizing coating material about the elongated material, said second die means communicating at one end thereof with said exit orifice of said first die means and having an exit orifice at an opposite end thereof which is aligned with said exit orifice of said first die means;

a cavity which is interposed between said first and second die exit orifices, the coating material being disposed in a continuum which extends from a free surface in said reservoir means, through said first die means and said cavity, and into said second die sizing means;

moving means for advancing the elongated material through said apparatus at a velocity which is sufficiently high to cause air to become entrained in the coating material, and to cause a pressure gradient to be established between said first die means and said second die means;

means for flowing coating material into said cavity at a pressure which sufficiently enhances the pressure gradient between said cavity and said first die means as to establish



a sufficient volumetric upward flow of coating material into said first die means to remove any bubbles adjacent to the elongated material and to cause the coated elongated material to be substantially bubble-free; and

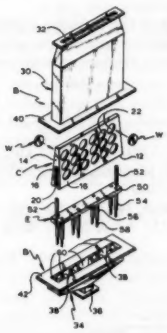
means for removing bubble entrained coating material flowing upwardly through said first die means into said reservoir before any substantial bubble coalescence occurs.

4,522,149

REACTOR AND SUSCEPTOR FOR CHEMICAL VAPOR DEPOSITION PROCESS

Dennis Garbis, Dix Hills; Joseph Y. Chan, Kings Park; Amedeo J. Granata, Flushing, and Robert C. Heller, Stony Brook, all of N.Y., assignors to General Instrument Corp., Clifton, N.J.

Filed Nov. 21, 1983, Ser. No. 553,962
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—725 **15 Claims**



1. A reactor for use in a chemical vapor deposition process comprising:

(a) a reaction vessel having a gas inlet, a gas outlet and a substantially vertical gas flow path therebetween;

(b) a substantially solid susceptor configured as a truncated

wedge, said susceptor comprising a body having a top, a bottom, a pair of longitudinally spaced ends, and a converging pair of opposed faces; each of said faces having means to receive a plurality of wafers and maintain the wafers exposed to said gas flow path, said susceptor being disposed within said reaction vessel with said opposed faces converging in a direction counter to that of said gas flow path; and

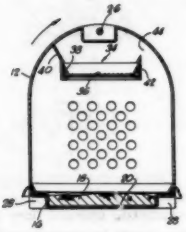
(c) heating means disposed about said reaction vessel for heating said susceptor.

4,522,150

CAT LITTER DISPOSAL HOUSING

Leonard Gershman, 10853 Rose Ave., #55, Los Angeles, Calif. 90034

Filed Jun. 12, 1984, Ser. No. 619,837
Int. Cl.³ A01K *23/00*
U.S. Cl. 119—1 **19 Claims**



10. A cat litter disposal system comprising:

a housing of sufficient size to easily accommodate a cat or other small animal;

litter storage means included in the bottom of said housing for receiving and storing particulate cat litter;

said housing including a removable container having a screen bottom mounted near but spaced from the top of said housing, said screen having openings slightly larger than the individual particles of the particulate cat litter, the space between one side of said container and one upper side portion of said housing being blocked, and the space between the other side of said container and said housing being open; and

means for rotating said housing through 360 degrees to move the cat litter from said litter storage means into said removable container;

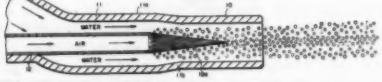
whereby the bulk of the cat litter falls through said screen, back to said litter storage means, and the fecal matter and associated litter is retained in said removable container.

4,522,151

AERATOR

Dominic S. Arbisi, 13001 Berkshire Dr., Minnetonka, Minn. 55343, and Coy E. Replogle, 8133 Portland Ave. South, Bloomington, Minn. 55420

Filed Mar. 14, 1983, Ser. No. 475,074
Int. Cl.³ A01K *63/00*; B01F *5/04*
U.S. Cl. 119—3 **6 Claims**



1. A device for aerating liquid comprising,

a nozzle member having a liquid discharge passage with an air discharge passage in spaced relation therewithin,

means for supplying liquid under pressure to said liquid discharge passage,

means for supplying air under pressure to said air discharge passage,

a conical air dispersing member perforated throughout a substantial portion of its length and attached to the end of said air discharge passage to distribute the flow of air into a substantial length of the stream of liquid surrounding said perforated conical air dispersion member and discharging the air into said stream in small bubbles through the perforations in said conical air dispersing member,

the end of the air and liquid discharge passage is spaced outwardly from the downstream end of the conical member,

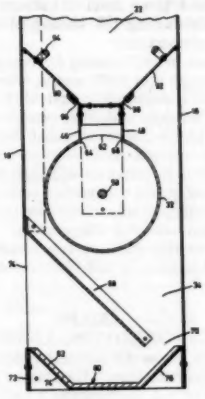
the liquid discharge passage has a frusto conical segment surrounding a substantial upstream portion of the length of said perforated conical member to maintain the velocity of the flowing liquid surrounding said perforated conical air dispersing member and provide a substantially reduced pressure zone surrounding said perforated member to increase the venturi action and the absorption of the air into the liquid stream within the nozzle unit.

4,522,152

ANIMAL FEEDER

James R. Meyer, Rte. 3, Box 267, Warrenton, Mo. 63383

Continuation-in-part of Ser. No. 406,303, Aug. 9, 1982, abandoned. This application Feb. 24, 1984, Ser. No. 583,109
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—56 R **7 Claims**



2. A feeder for animals, such as pets and the like, comprising a housing, said housing being comprised of a top feed storage compartment, a pair of downwardly sloping walls defining a V-shaped hopper at the bottom of said feed storage compartment, said walls being spaced from one another at the bottom do define a feed opening, a cylindrical metering valve communicating with said feed opening for dispensing a selected amount of feed, said cylindrical metering valve being hollow and having a slot-like arcuate axially extending opening, handle means for rotating said cylindrical metering valve into and out of registry with said feed opening to fill and dispense feed from the cyclindrical metering valve, and a bottom animal feeding compartment in said housing, at least one of said downwardly sloping walls comprising a plate-like wall member having means for supporting a lower portion against a fixed lower hopper wall and an upper portion extending in a rest position against an inside wall of the hopper, said fixed lower hopper wall being interiorly spaced from said inside wall of the hopper, said plate-like wall member being removable to expose a passageway from the feed storage compartment at the top of

the housing to one side of the cylindrical metering valve to the bottom animal feeding compartment whereby the interior of the housing may be substantially filled for extended self-feeding periods.

4,522,153

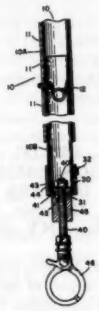
TRAINING AND CONTROL LEASH

Charles Vander Horst, 916 S. Reynolds Rd., Lot 137, Toledo, Ohio 43615

Filed Aug. 27, 1984, Ser. No. 644,935

Int. Cl.³ A01K *27/00*

U.S. Cl. 119—109 **8 Claims**



1. A training and control leash comprising a rigid control rod;

a removable hollow cap surrounding the bottom end portion of said control rod and said removable cap being provided with a circular aperture opening central of its bottom cover;

an elongated threaded bolt of less diameter than the diameter of said aperture extending partially within said removable cap;

a swivel ball piece disposed within said removable, hollow cap and provided with a smooth hollow cylindrical opening throughout its center through which the upper end portion of said threaded bolt protrudes;

a threaded nut screwed on the upper protruding end portion of said threaded bolt to retain said swivel ball on said threaded bolt and within said hollow cap;

a removable collar clamp means secured to the lower end portion of said threaded bolt for removably clamping said threaded bolt and said control rod to a dog collar;

an adjustable threaded thumb nut screwed on to said threaded bolt between said collar clamp means and said hollow cap in order to adjust by screwing means the extent of swivel desired in the control of a dog or animal being controlled.

4,522,154

FLUIDIZED BED COMBUSTION BOILER

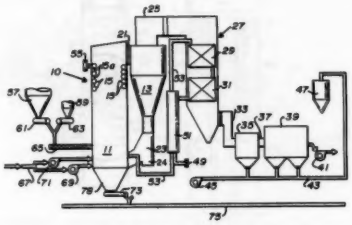
Edward S. Taylor, Del Mar, Calif., and Leif W. Bengtsson, Helsinki, Finland, assignors to Pyropower Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 351,581, Mar. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 240,245, Mar. 3, 1981, abandoned. This application Feb. 8, 1984, Ser. No. 578,068

Int. Cl.³ F22B *1/00*

U.S. Cl. 122—4 D **6 Claims**

1. A circulating fluidized bed combustion boiler for producing steam from water containing a substantial proportion of dissolved solids, comprising, a substantially vertical elongated combustion chamber, circulation means for circulating a combusting fluidized bed upwardly through said combustion chamber from the lower end thereof to the upper end thereof, said circulating means including means for withdrawing gasses and entrained solids from the upper end of said combustion chamber and for separating solids from said fluidized bed after passage through said combustion chamber and for storing said solids for return to said combustion chamber at the lower end thereof, and tube means arranged in a single layer around the outer periphery of said combustion chamber, said tube means comprising at least one coiled tube with the convolutions thereof being joined by a web throughout substantially the



entire length of said tube, said means including inlet means positioned toward the lower end of said combustion chamber and including outlet means positioned toward the upper end of said combustion chamber and being of a configuration to provide an ascending helical flow path for fluid passing therethrough and such that the region of higher steam quality in said tube means coincides with the region of lowest heat transfer coefficients, and means for establishing a flow of fluid in said tube means to result in a steam quality and flow velocity sufficient to prevent deposition of solids on said tube means.

4,522,155

METHOD AND APPARATUS FOR CONTROLLING THE HEATING EFFECT OF HIGH TEMPERATURE GASES TO BE SUPPLIED TO A HEAT EXCHANGER

Frohmut Vollhardt, Siegen-Bürbach, and Heinz Haacker, Kreuztal-Ferndorf, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburgg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 381,748

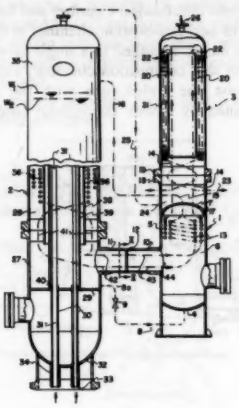
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121297

Int. Cl.³ F22B *1/00*

U.S. Cl. 122—7 R **17 Claims**

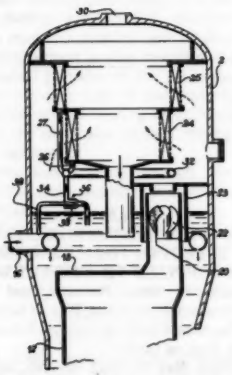
1. A heat exchanger device comprising a steam producing gas cooler having a water steam space therein and a tubular conduit for the passage of high temperature gases therethrough, a vessel having a bottom wall with an inlet above said bottom wall connected to the high temperature gases of said steam producing gas cooler, said vessel having a tubular portion for the high temperature gases connected from said inlet to a discharge, a liquid connection from said steam producing gas cooler to the bottom of said vessel, means in said liquid line for controlling the amount of liquid passed into said vessel, the inlet for said high temperature gas being located above the

bottom of said vessel and a superheater disposed over said vessel and having a tubular connection therein for the passage



of the high temperature gases from said vessel through said superheater.

4,522,156
STEAM GENERATOR
Jean E. Chaix, Manosque, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Jun. 7, 1982, Ser. No. 386,075
Claims priority, application France, Jun. 16, 1981, 81 11833
Int. Cl.³ F22B *1/06*
U.S. Cl. 122—34 **2 Claims**



1. A steam generator comprising: an enclosure having a vertical axis;

a plurality of U-tubes having inner and outer wall surfaces within said enclosure, primary liquid circulating within said U-tubes contacting the inner wall surfaces and secondary liquid contacting the U-tube outer wall surfaces;

a cylindrical envelope sealed at its upper part by a cover and surrounding said plurality of U-tubes, said cylindrical envelope and the inner wall of said enclosure together defining an annular passage, a secondary liquid supply line communicating with a portion of said enclosure above said cover, said portion in turn communicating with the upper part of said annular passage, and the lower part of said annular passage communicating with the interior of said envelope;

at least one passageway communicating through said cylindrical envelope cover to an upper part of said enclosure;

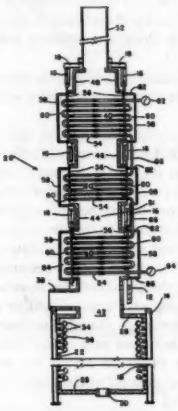
a centrifugal water/steam separator within said passageway;

at least one steam dryer of annular configuration surrounding the axis of said enclosure within said upper part of said enclosure for separating water from steam;

at least one discharge pipe connected to the lower part of said dryer for removing water separated from steam by said dryer; and

a suction device connected to said discharge pipe for sucking in water separated by said dryer, said suction device including a removal pipe for discharging water separated by said dryer, a convergent section defined in said removal pipe, a duct connected at an inlet end to said secondary liquid supply line and having a nozzle at an outlet end injecting secondary liquid into said convergent section for producing suction.

4,522,157
CONVECTION SECTION ASSEMBLY FOR PROCESS HEATERS
Thomas F. O'Sullivan, Montclair, N.J., and Thomas W. Gronauer, Briarcliff Manor, N.Y., assignors to Lummus Crest Inc., Bloomfield, N.J.
Continuation of Ser. No. 431,901, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 221,801, Dec. 31, 1980, abandoned. This application Feb. 21, 1984, Ser. No. 581,818
Int. Cl.³ F22B *37/24*; F28F *9/00*
U.S. Cl. 122—510 **15 Claims**



1. A convection section assembly for a heater which comprises:

a plurality of vertically disposed support members; a flue means; at least two heat transfer segments mounted in vertical array, each segment comprising a pair of horizontally disposed beam support members mounted to said vertically disposed support members and located outside said flue means, the length of said members being a dimension of choice; a plurality of parallel and vertically disposed tube sheet members mounted to said beam support members and having orifices; wall means for enclosing ends of said tube sheet members; a plurality of horizontally disposed tube means including return bends for passage of a process fluid therethrough positioned within the orifices of said tube sheet members, said tube sheet members requiring no additional support means intermediate their extremities; inlet conduit means for introducing a

process fluid to be heated into said tube means of said heat transfer segments; and outlet conduit means for withdrawing the heated process fluid from said tube means of said heat transfer segments.

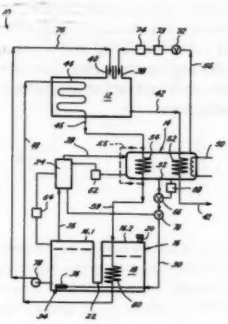
12. A heater assembly for process fluids, which comprises a first plurality of vertically-disposed support members; side and end walls enclosed by top and bottom walls mounted to said vertically-disposed support members and defining a heating zone having reactant tube means; burner means for heating said reactant tube means; inlet conduit means for introducing a process fluid to be heated into said reactant tube means; outlet conduit means for withdrawing a reactant gas from said reactant tube members; a second plurality of vertically disposed support members; a flue means; at least two heat transfer segments mounted in vertical array, each segment comprising a pair of horizontally disposed beam support members mounted to said second plurality of support members and located outside said flue means, the length of said members being a dimension of choice; a plurality of parallel and vertically disposed tube sheet members mounted to said beam support members and having orifices; wall means for enclosing ends of said tube sheet members; a plurality of horizontally disposed tube means including return bends for passage of a process fluid therethrough positioned within the orifices of said tube sheet members, said tube sheet members requiring no additional support means intermediate their extremities; inlet conduit means for introducing a process fluid to be heated into said tube means of said heat transfer segments; and outlet conduit means for withdrawing the heated process fluid from said tube means of said heat transfer segments.

4,522,158

SUPPLY OF HYDROCARBON FUELS

Lester R. Wisegerber, 38 Brown La., Dayton, Tex. 77535

Filed Dec. 3, 1982, Ser. No. 446,674
Int. Cl.³ F02B *43/08*
U.S. Cl. 123—1 A **30 Claims**



1. A fuel supply system for the supply of a hydrocarbon fuel to an internal combustion engine, the sytem comprising:

(a) a pressure storage vessel for storing a hydrocarbon fuel vapor under pressure;

(b) compressor means for withdrawing hydrocarbon fuel vapor from a liquid hydrocarbon fuel tank and feeding the vapor under pressure to the pressure storage vessel;

(c) heating means for maintaining the fuel vapor in a heated condition during use;

(d) recycle means for recycling fuel vapor from the pressure storage vessel to the fuel tank for heating and agitating fuel in such a fuel tank;

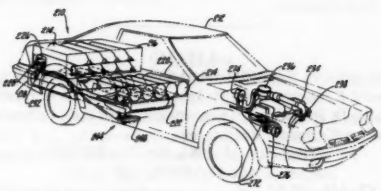
(e) supply means leading from the pressure storage vessel for the supply of fuel vapor to an internal combustion engine during use.

4,522,159

GASEOUS HYDROCARBON FUEL STORAGE SYSTEM AND POWER PLANT FOR VEHICLES AND ASSOCIATED REFUELING APPARATUS

Larry J. Engel, Rochester, and John W. Turko, River Rouge, both of Mich., assignors to Michigan Consolidated Gas Co., Detroit, Mich.

Filed Apr. 13, 1983, Ser. No. 484,521
Int. Cl.³ F02B *43/00*
U.S. Cl. 123—1 A **34 Claims**



1. In a system having a gaseous hydrocarbon fuel powered vehicle and a refueling apparatus for said vehicle, the improvement comprising in combination:

inlet means on said refueling apparatus adapted to be connected in fluid communication with a source of said gaseous fuel;

compressor means on said refueling apparatus for compressing said gaseous fuel in order to increase the pressure thereof up to a first predetermined pressure level;

cooling means on said refueling apparatus for decreasing the temperature of said compressed gaseous fuel;

sorbent filter means on said refueling apparatus for sorptively removing at least a portion of certain predetermined constituents of said gaseous fuel therefrom;

discharge means on said refueling apparatus for supplying said compressed gaseous fuel to said vehicle, said discharge means including a discharge fluid conduit selectively and releasably connectable to a fuel inlet means on said vehicle in order to selectively refuel the same;

at least one storage vessel on said refueling apparatus, said refueling apparatus storage vessel containing a sorbent material therein for sorptive storage of a first predetermined quantity of said compressed gaseous fuel in said refueling apparatus storage vessel;

vehicle storage means for storing a second predetermined quantity of said compressed gaseous fuel on said vehicle, said vehicle storage means including a sorbent material for sorptively storing said second predetermined quantity of said compressed gaseous fuel;

refueling apparatus control means for supplying said filtered and compressed gaseous fuel to said vehicle from either said compressor means or said refueling apparatus storage vessel, said control means causing said filtered and compressed gaseous fuel to be supplied to said vehicle from said refueling apparatus storage vessel when the pressure therein is generally at or above a second predetermined pressure level and further causing said refueling apparatus storage vessel to be bypassed by said filtered and compressed gaseous fuel when said refueling apparatus storage vessel pressure drops below a third predetermined level, said refueling apparatus control means further causing said filtered and compressed gaseous fuel to be supplied to said refueling apparatus storage vessel after said discharge fluid conduit has been selectively disconnected from said vehicle fuel inlet means or alternatively after the pressure of the compressed gaseous fuel in said vehicle storage means has increased to a fourth predetermined pressure level, said compressed gaseous fuel being supplied to said refueling apparatus storage vessel until the pressure in said refueling apparatus storage vessel is generally at said second predetermined pressure level;

a prime mover on said vehicle having means for combining

said compressed gaseous fuel with air to produce mechanical energy necessary to move said vehicle;

means on said vehicle for conveying said compressed gaseous fuel to said vehicle storage means from said fuel inlet means and for conveying said compressed gaseous fuel from said vehicle storage means to said combining means of said prime mover; and

vehicle sorbent filter means on said vehicle associated with said conveying means for sorptively filtering the flow of said compresssed gaseous fuel to said vehicle storage means, said vehicle sorbent filter means including a sorbent material.

4,522,160

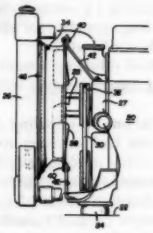
FAN-SHROUD STRUCTURE

Leonard E. Speers; John D. Inhofer, both of Terre Haute, and Philip D. Redenbarger, Centerpoint, all of Ind., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 23, 1984, Ser. No. 572,738

Int. Cl.³ F01P *5/06*

U.S. Cl. 123—41.49 **4 Claims**



1. A shroud structure for use with a radiator and liquid cooled internal combustion engine having a multi-bladed fan rotatably mounted on said engine intermediate said engine and said radiator, said engine and radiator being mounted for movement relative to each other, said shroud structure including:

a one-piece generally rigid fiberglass shroud having a generally rectangular base perimeter portion which is integral with and merges into an opposed annular bell-mouthed venturi perimeter portion;

said venturi perimeter portion surrounding said rotatable fan and being attached to said engine such that a small clearance is formed between the blades of said fan and the inner periphery of said venturi portion;

said rectangular base perimeter portion being fitted between a pair of finger-like gripping ring portions of a complementary generally rectangular bulbous flexible seal which is secured to said radiator, and said flexible bulbous seal accommodating the relative movement between said engine and radiator to prevent damage to said shroud structure from said rotatable fan.

4,522,161

VALVE SEAT INSERTS

Roger H. Slee, Warwick, England, assignor to AE PLC, Rugby, England

Filed Sep. 9, 1983, Ser. No. 530,682

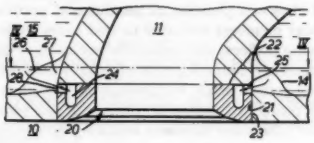
Claims priority, application United Kingdom, Sep. 11, 1982, 8225966

Int. Cl.³ F01L *3/22*

U.S. Cl. 123—41.85 **9 Claims**

1. A water-cooled internal combustion engine comprising at least one cylinder and valve-controlled inlet and exhaust ports communicating with said cylinder, at least one of said ports including an annular valve seat insert fitted in an annular rabbet, the rabbet communicating with the water-cooling system through apertures provided therein, the valve seat insert being provided with a passage extending therearound and opening on to the rabbet, the passage communicating with the water-cooling system of the engine through apertures provided in the valve seat insert and said apertures provided in the rabbet to allow water to flow to, through, and out of the passage, so cooling the valve seat insert and an associated valve, the number and arrangement of the rabbet apertures and the valve seat insert apertures being such that at least four rabbet apertures and valve seat apertures are in communication, whatever the angular disposition of the valve seat insert relatively to the rabbet.

8. A method of manufacturing of a water-cooled internal combustion engine of the kind comprising at least one cylinder having valve-controlled inlet and exhaust ports communicating with said cylinder, the method comprising casting a portion of the engine with a port, with passages for cooling water



and with a part in which a rabbet is to be formed for receiving a valve seat insert, the rabbet-forming part of the casting being annular with a continuous outer surface in which the rabbet is formed and an inner surface forming a surface of the cooling water passage, the inner surface being cast with an angularly-spaced succession of projections and depressions therearound, such that the edge between two surfaces defining the rabbet, when formed, passes through the depressions to form, between adjacent projections, apertures leading into the rabbet, forming said casting with said rabbet and then fitting in said rabbet a valve seat insert including an annular body having two adjacent annular surfaces that are normal to one another and which engage said rabbet surfaces, and a passage extending around the valve seat and opening onto one of said insert surfaces to communicate with said rabbet apertures for the flow of cooling water therethrough.

4,522,162

PORTABLE GAS-POWERED TOOL WITH LINEAR MOTOR

Milovan Nikolich, Chicago, Ill., assignor to Signode Corporation, Glenview, Ill.

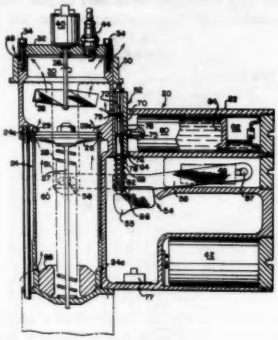
Division of Ser. No. 227,193, Jan. 22, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,559

Int. Cl.³ F02B *71/00*

U.S. Cl. 123—46.5 C **5 Claims**

1. The method of self-starting a working member comprising the steps of: providing a combustion chamber, providing a working member exposed to the products of combustion in said chamber, introducing a fuel and air mixture into said chamber, mixing and turbulating the fuel and air in said cham-

ber under atmospheric conditions independent of the operation of said working member, and thereafter igniting the mixture to



form an explosion in the combustion chamber prior to initial movement of the working member.

4,522,163

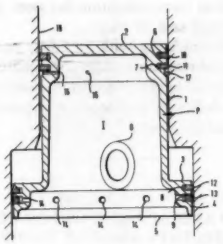
STEPPED PISTON AND STEPPED PISTON ENGINE

Bernard Hooper, Maybank House, Hope St., Wordsley, Stourbridge, West Midlands, England (DY8 5QB)

Filed Jan. 18, 1983, Ser. No. 459,062

Int. Cl.³ F01M *3/04*

U.S. Cl. 123—73 F **10 Claims**



1. A stepped piston for an engine of the kind having at least one cylinder, the cylinder comprising a pumping part of a first diameter and a working part of a second diameter, combustion of a fuel/air mixture taking place in the working part of the cylinder, the first diameter of the pumping part being greater than the second diameter of the working part, the piston comprising a body with a smaller diameter working part slidable in the working part of the cylinder, and a larger diameter pumping part slidable in the pumping part of the cylinder, the working part extending from the top of the piston to a step, and the pumping part extending from the step to a lower end of the piston, an interior hollow opening to the outside at the lower end of the piston, at least one piston ring groove formed in an outer surface of the working part of the piston, and at least one piston ring groove formed in another surface of the pumping part of the piston, each piston ring groove, in use, receiving a piston ring, at least two metering openings providing controlled flow of a predetermined amount of lubricant from the interior hollow to the outer surface of the working part of the piston, the total cross-sectional area of the openings being of an amount in the range determined according to the formula:

$$M = \frac{A}{K}(PN)^{\frac{3.7}{K}}$$

where M is the total cross-sectional area of the openings in square mm, A is the cross-sectional area of the working part of the piston in square cm, P is the brake mean effective pressure of the engine at maximum power in atmospheres, N is the engine speed at maximum power in revolutions per minute, and K lies between 29 and 41.

4,522,164

COLD-START ASSISTING DEVICE FOR COMBUSTION ENGINES

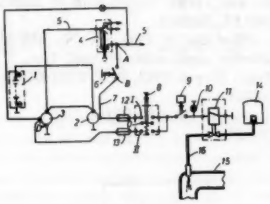
Gerhard Fränkle, Remshalden, and Peter Joppig, Korb, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,806

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222941

Int. Cl.³ F02M *1/16*

U.S. Cl. 123—180 R **16 Claims**



5. Cold-start assisting device for an internal combustion engine which drives a device for producing electrical potential and which has a starter for starting the engine, a battery for providing operating potential to the starter, and means for selectively coupling the battery to the starter, the assist system including a source of cold-starting fluid, means for coupling the cold-starting fluid source to the engine's induction system including a cold-starting fluid valve, and an electric circuit for selectively coupling the valve to the device for producing electrical potential for actuation thereby such that the absence of electrical potential from the device prevents operation of the valve through the circuit when the engine is dead.

4,522,165

NOISE REDUCING COVER FOR AN INTERNAL COMBUSTION ENGINE

Naoki Ogawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 155,237, Jun. 2, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 516,982

Claims priority, application Japan, Jun. 2, 1979, 54-68214; Jun. 2, 1979, 54-68215; Jun. 23, 1979, 54-85445[U]; Jun. 23, 1979, 54-85446[U]

Int. Cl.³ F02F *7/00*

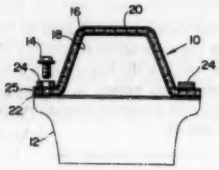
U.S. Cl. 123—195 C **23 Claims**

1. A noise reducing cover for an internal combustion engine, comprising:

a body portion formed into a self supporting three dimensional shape of a first vibration and sound absorbing porous material;

an inner layer formed of a second vibration and sound absorbing material, securely connected to the inner side of said body portion to form a composite, the inner layer

being adapted to be directly connected to a surface of the engine and impervious to liquids; and



wherein the Shore hardness (HsD) of said composite is lower than 70.

4,522,166

DEVICE FOR THE IMPROVING OF THE STARTING OF AN ENGINE

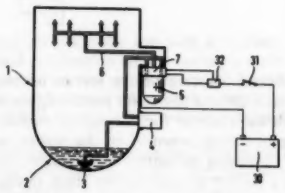
Ilkka Toivio, and Terttu Toivio, both of Likolammenkatu 15, 15850 Lahti 85, Finland

Filed Dec. 6, 1983, Ser. No. 558,423

Claims priority, application Finland, Dec. 7, 1982, 823746; PCT Int'l Appl., May 4, 1983, PCT/FI83/00039; Finland, Aug. 18, 1983, 832963

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 A **7 Claims**



1. A device for improving the cold starting of an internal combustion engine having an engine lubricating oil system including an oil reservoir, a main engine oil duct and an oil filter interposed between said oil reservoir and main engine oil duct comprising means defining a chamber, said chamber means having an inlet and an outlet, said chamber being connected in said lubricating oil system whereby said inlet is connected for receiving oil from said reservoir and said outlet connected in communication with said engine oil duct, a heating element disposed in said chamber in heat transfer relationship to the oil flowing therethrough, said chamber means being interposed directly between said main oil engine duct and said oil filter and including flow guide means interposed in said chamber for directing the flow of oil therethrough from said inlet to said outlet, said flow guide means comprises a baffle plate disposed normal to said inlet and outlet, an end wall connected to and circumscribing said baffle plate, and said heating element being connected to said end wall in heat transfer relationship to the oil flow defined by said baffle plate, a battery, and an electrical circuit connecting said heating element to said battery, said circuit comprising switch means interposed between said heating element and said battery, whereby said heating element can be energized and de-energized, depending on the position of said switch, and a thermostatic control disposed in said circuit for controlling the temperature of the oil being heated in said chamber.

4,522,167

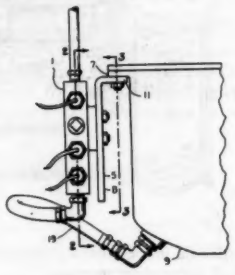
LUBRICATING OIL MONITOR

Erwin E. Hurner, 2605 S. Rivershore, Moorhead, Minn. 56560

Continuation-in-part of Ser. No. 218,918, Dec. 22, 1980, Pat. No. 4,421,078, which is a continuation-in-part of Ser. No. 192,077, Sep. 29, 1980, abandoned. This application Dec. 15, 1983, Ser. No. 561,739

Int. Cl.³ F01M *11/12*

U.S. Cl. 123—196 S **9 Claims**



1. An apparatus for attachment to an internal combustion engine to monitor lubricating oil levels within an oil pan of a lubrication system thereof comprising;

means defining an elongated monitoring chamber, said chamber having a bottom and said means further defining on either said thereof a plurality of ports communicating with said chamber, said ports on one side being offset vertically from the ports on the other side thereof;

means for mounting said elongated chamber in a vertical orientation;

means in fluid communication between the bottom of said chamber and said oil pan;

means communicating with an upper part of said chamber and said lubrication system for equalizing gaseous pressure above oil in said chamber and said lubrication system;

means for detecting presence or absence of oil at a level within said chamber.

4,522,168

METHOD AND APPARATUS FOR CONTROLLING FUEL-INJECTION AMOUNT IN DIESEL ENGINE

Toshihisa Ogawa, Susono; Hideo Miyagi, Okazaki; Masaomi Nagase, and Kiyotaka Matsuno, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 13, 1983, Ser. No. 513,293

Claims priority, application Japan, Jan. 31, 1983, 58-013910

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—198 D **4 Claims**

1. A method for controlling the fuel-injection amount in a diesel engine having a rotational angle sensor for detecting the engine speed, comprising the steps of:

detecting whether said rotational angle sensor is in an abnormal state;

detecting whether said engine is being recranked when said rotational angle sensor is in an abnormal state;

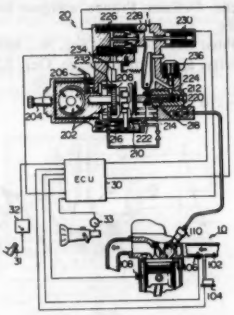
determining a delay time period for delaying cranking of the engine, the delay time period being determined longer during re-cranking than during initial cranking;

detecting whether the accelerator opening is smaller than a predetermined opening;

detecting whether the vehicle speed of a vehicle in which said engine is disposed is less than a predetermined speed;

detecting whether an elapsed time period is equal to said determined delay time period while said accelerator open-

ing is smaller than said predetermined opening and the vehicle speed is less than said predetermined speed; and



performing a fuel-cutting operation when said elapsed time period is equal to said determined delay time period.

4,522,169

VARIABLE CYLINDER DEVICE FOR INTERNAL COMBUSTION ENGINES

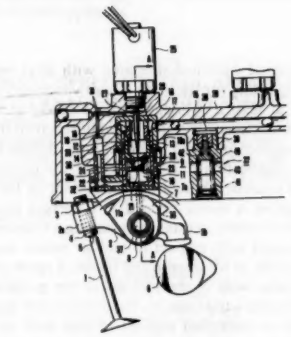
Fuminao Arai, Chiryu, and Yoshio Okabe, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 23, 1983, Ser. No. 535,259

Claims priority, application Japan, Sep. 29, 1982, 57-170669; Sep. 29, 1982, 57-147790[U]; Sep. 29, 1982, 57-147792[U]

Int. Cl.³ F01L *1/24;* F02D *13/06*

U.S. Cl. 123—198 F **5 Claims**



1. A variable cylinder device for an internal combustion engine, comprising:

a valve lift mechanism having a rocker arm which rocks around a rocker shaft and causes an intake or exhaust valve to operate in response to a rotary movement of a camshaft;

an oil-supplying type lash adjuster fixed to a housing at its upper portion and fitted to a rocker support at its lower end portion, said rocker shaft being fixed to said rocker support;

a mechanism for shifting the rocking fulcrum of said rocker arm so that the rocker arm rocks around its one end which is in contact with the upper end of a valve stem of said intake or exhaust valve, causing said rocker support to be movable up-and-down with the rocker shaft, thereby maintaining a closed position of said intake or exhaust valve;

said rocker support having a pipe protruding upwards and slidably inserted into a longitudinal hole formed in said housing and a lubrication oil passage which connects said pipe with a sliding surface between said rocking shaft and said rocker arm;

said housing having a main oil passage for supplying oil to said lash adjuster and a lubrication oil passage which connects said main oil passage with said longitudinal hole in the housing; and

said sliding surface between the rocking shaft and the rocker arm being supplied with lubrication oil from said main oil passage through said lubrication oil passage in said housing, said pipe protruding from the rocker support and said lubrication oil passage in said rocker support.

4,522,170

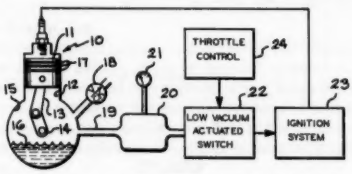
LOW ENGINE OIL SENSING METHOD

Michael Lenk, Toledo, and Richard S. Podiak, Maumee, both of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 30, 1984, Ser. No. 605,350

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—198 DC **7 Claims**



1. In a reciprocating piston engine having a crankcase containing a lubricating oil and having a crankcase gas pressure which varies as the piston reciprocates, a method for sensing a low crankcase oil volume while the engine is operating comprising the steps of: venting through a check valve positive pressure gas in the crankcase to maintain an average vacuum in the crankcase of the operating engine, such vacuum decreasing in average magnitude as the volume of oil in the crankcase decreases; and determining from the magnitude of the crankcase vacuum when there is insufficient oil in the crankcase.

4,522,171

PRE-COMBUSTION OR TURBULENCE CHAMBER FOR INTERNAL COMBUSTION ENGINES

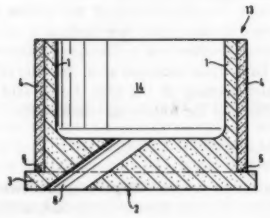
Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,072

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222815; Jan. 29, 1983, 3303048

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—270 **14 Claims**



1. Pre-combustion or turbulence chamber for an internal combustion engine, comprising side walls and a bottom wall forming an inner chamber, said side walls and bottom wall are formed of a material having a good thermal conductivity,

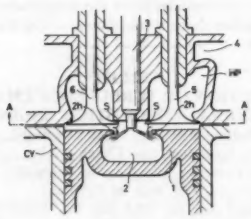
means for providing thermal insulation for at least said side walls of said inner chamber, wherein the improvement comprises that said side walls and bottom wall are formed by an inner molded body defining the inner chamber, said means comprises an outer molded body providing thermal insulation for said inner molded body, said outer molded body secured to said inner molded body with said inner molded body in closely fitting contact with said outer molded body, said outer molded body enclosing at least said side walls of said inner molded body, said inner molded body is formed of a material having thermal conductivity of at least 12 W/m·K) and selected from one of the group consisting of sintered aluminum oxide, sintered silicon carbide, sintered silicon nitride, a high temperature alloy consisting of 57 to 75% by weight nickel, up to 20% by weight chromium, between 0 and 18% by weight cobalt, up to 1.5% by weight aluminum and up to 2.4% by weight titanium so that all of these components add up to 100% by weight, and said outer molded body is formed of a ceramic material selected from the group consisting of sintered aluminum titanate or sintered zirconium oxide having a thermal conductivity of less than 10 W/m·K).

4,522,172

DIRECT INJECTION INTERNAL COMBUSTION ENGINE OF COMPRESSION IGNITION TYPE

Yujiro Oshima, and Taro Aoyama, both of Aichi, Japan, assignors to K.K. Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jul. 8, 1983, Ser. No. 512,055
Claims priority, application Japan, Jul. 9, 1982, 57-120195
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—276 **12 Claims**



1. A direct injection internal combustion engine of a compression ignition type comprising:

a piston reciprocated within a cylinder,

a cavity formed in a top surface of said piston, said cavity being formed in said piston top surface so as to have its inlet opening throttled while allowing remaining portions to have a large cross-sectional area, the ratio of the area A of said inlet opening to the area Ao of said piston top surface satisfying the following relationship:

$$0.07 \leqq A/Ao \leqq 0.25;$$

and a fuel injection nozzle, comprising; fuel swirling means for effecting a swirling motion of the fuel, and an injection port positioned at the central portion of said cavity and directed within the cavity,

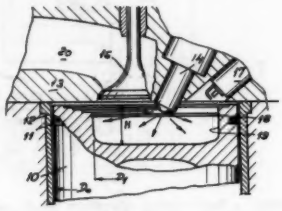
said nozzle injecting fuel from said injection port toward the circumferential wall of said cavity in a spray pattern of a hollowed conical shape having a predetermined spray angle and tangential velocity component.

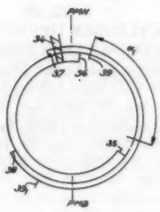
4,522,173

INTERNAL COMBUSTION ENGINE USABLE WITH A HIGH VAPORIZATION HEAT FUEL

Georges Agache, Orléans, France, assignor to Chenesseau, Orleans, France

Filed Oct. 20, 1983, Ser. No. 544,120
Claims priority, application France, Oct. 22, 1982, 82 17719
Int. Cl.³ F02F *3/26*
U.S. Cl. 123—276 **10 Claims**





1. An internal combustion engine with dirct injection and controlled ignition, for use with a high vaporization heat fuel, comprising at least a cylinder with air intake means and exhaust gas outlet means; a piston slidably received in said cylinder for reciprocating said cylinder and defining with said cylinder a combustion chamber; means for creating, in said combustion chamber, a swirling movement of the intake air, which comprise a recess formed in a surface of said piston limiting said chamber, substantially having a rotational symmetry and disposed with respect to said air intake means so that the gases are set in rotation in the recess, a spark plug carried by the cylinder wall in the vicinity of the periphery of said recess and means supported by the cylinder for injecting into the chamber a controlled amount of fuel with an adjustable injection advance of at least 140° during cold start and more than 180° on normal operation.

4,522,174

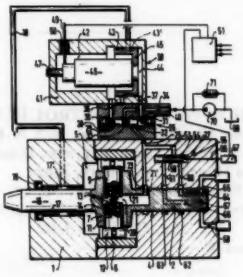
METHOD FOR THE INJECTION OF FUEL AND FUEL INJECTION APPARATUS FOR PERFORMING THE METHOD

Rudolf Babitzka, Kirchberg, and Ernst Linder, Mühlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 559,118
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248713
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—300 **7 Claims**

2. A fuel injection apparatus for an internal combustion engine having externally supplied ignition comprising at least one work chamber enclosed within a cylinder by at least one pump piston, said work chamber being connectable during a compression stroke of said at least one pump piston with an injection location via at least one feed line and connected

during an intake stroke of said at least one pump piston with a fuel supply conduit and, in order to control the duration of injection, said cylinder is connected at specific segments of the compression stroke, with a relief chamber via a controlled relief line, the fuel injection apparatus comprising a distributor being driven at pump rpm for rotation in a cylinder, by means of said distributor, fuel pumped by said at least one pump piston is delivered in sequence, in the course of the rotation of the distributor, to injection lines, which in accordance with the



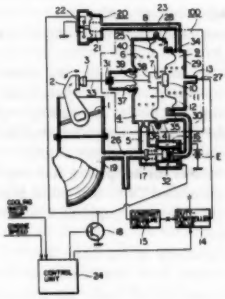
number of injection locations to be supplied are disposed spaced apart from one another by identical angular distances and distributed on the circumference of the cylinder, for injecting fuel into specific combustion chambers of an engine in which the distributor has two distributor openings, which are connectable in alternation, depending on load, with the pump work chamber and which are spaced apart from one another by an angular distance in the direction of rotation which is equal to the angular distance between two injection lines leading away from said cylinder.

4,522,175

ROTATIONAL SPEED CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Hiroshi Kamifuji; Tomoo Ito, and Chiaki Niida, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1984, Ser. No. 598,740
Claims priority, application Japan, Apr. 11, 1983, 58-62296
Int. Cl.³ F02N *3/06*
U.S. Cl. 123—339 **5 Claims**



1. A rotational speed control apparatus for an internal combustion engine comprising:

(a) a throttle valve disposed in an intake pipe;

(b) a driving diaphragm arranged for interlocking operation with said throttle valve through an actuating shaft for driving said throttle valve;

(c) a driving negative pressure chamber defined by said driving diaphragm and a front cover;

(d) a driving negative pressure passage connecting said driving negative pressure chamber to said intake pipe at a position downstream of said throttle valve for introducing a driving negative pressure into said driving negative pressure chamber;

(e) a signal-responsive diaphragm provided with an air regulating valve member regulating the quantity of air introduced into said driving negative pressure chamber through an air passage opening into said driving negative pressure chamber;

(f) a signal negative pressure chamber defined by said signal-responsive diaphragm and an end cover;

(g) a signal negative pressure passage connecting said signal negative pressure chamber to a signal negative pressure source for introducing a controlled signal negative pressure into said signal negative pressure chamber;

(h) signal negative pressure control means including a signal negative pressure regulating valve for controlling said signal negative pressure;

(i) abnormal operation detecting means for detecting an abnormal operation occurring when the negative pressure in said signal negative pressure chamber deviates from the level set for the normal operation of said signal-responsive diaphragm; and

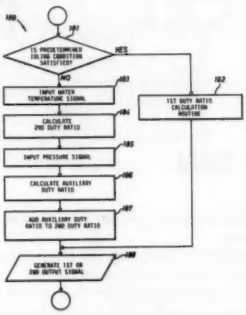
(j) pressure control means for controlling the internal pressure of said driving negative pressure chamber so that, when said abnormal operation detecting means detects the abnormal operation, the internal pressure of said driving negative pressure chamber is shifted to the level at which said driving diaphragm is rendered substantially non-operable.

4,522,176

AIR FLOW CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Mitsunori Takao, Kariya; Takahiko Kimura, Nagoya, and Yuji Hirabayashi, Chita, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 1, 1984, Ser. No. 636,602
Claims priority, application Japan, Aug. 4, 1983, 58-142735
Int. Cl.³ F02D *33/02*
U.S. Cl. 123—339 **5 Claims**



1. An air flow control apparatus for controlling an amount of air flow under control of a throttle valve in an internal combustion engine, the control apparatus comprising:

first means for producing a first signal indicative of operating condition of said engine;

second means for detecting change of the atmospheric pressure and for producing a second signal indicative of the actual atmospheric pressure;

third means for determining whether or not a value of said first signal indicates an idling condition of said engine if so, producing a first determination signal and if not, producing a second determination signal;

fourth means responsive to said first determination signal for determining, in dependence upon the value of said first signal, a first parameter indicative of an amount of air flow into said engine necessary for maintaining the operation of said engine in a desired idling condition;

fifth means responsive to said second determination signal for determining, in dependence upon the value of said first signal, a second parameter indicative of an amount of air flow into said engine based on a first predetermined relationship between the second parameter and loaded condition of said engine;

sixth means for determining, in dependence upon a value of said second signal, a third parameter indicative of an additional amount of air flow into said engine based on a second predetermined relationship between the third parameter and the atmospheric pressure;

seventh means for compensating the second parameter in accordance with the third parameter;

eighth means for producing a first output signal indicative of the first parameter and for producing a second output signal indicative of the compensated second parameter; and

ninth means responsive to said first and second output signals for controlling an amount of air flow respectively in accordance with idling and loaded conditions of said engine.

4,522,177

TEMPERATURE COMPENSATED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

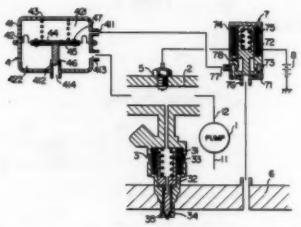
Hisasi Kawai, Toyohashi; Toshikazu Ina, Aichi; Toshihiko Igashira, Toyokawa; Ken Nomura, Okazaki; Masakazu Yoshida, Toyota; Takao Komoda, Okazaki, and Makio Hamanishi, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 15, 1982, Ser. No. 434,540

Claims priority, application Japan, Oct. 19, 1981, 56-165644; Oct. 19, 1981, 56-166713; Oct. 26, 1981, 56-170965

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—478 **3 Claims**



1. A fuel injection system for internal combustion engines comprising:

sensor means for detecting the temperature of at least one of fuel and cooling water in an engine;

means for supplying gasoline fuel to said engine; and

fuel delivery control means for increasing the quantity of fuel supplied by said fuel supply means when said temperature detected by said temperature sensor means is higher than 40° C. to compensate for a decrease in fuel supplied caused by fuel vaporization,

wherein said fuel supply means comprises fuel injection valve means, and

where said fuel delivery control means comprises a pressure regulator including a first diaphragm chamber for receiving negative pressure in an intake pipe of said engine or atmospheric pressure and a second diaphragm chamber separated from said first diaphragm chamber by a diaphragm for receiving fuel in a fuel supply passage, and negative pressure change-over means for selectively introducing said intake pipe negative pressure and said atmospheric pressure into said first diaphragm chamber of said pressure regulator, whereby said intake pipe negative pressure is introduced into said first diaphragm chamber when the fuel temperature detected by said temperature sensor means is lower than said predetermined value and said atmospheric pressure is introduced into said first diaphragm chamber when said fuel temperature is higher than said predetermined value, thereby injecting the fuel under a high pressure when said fuel temperature is high.

4,522,178

METHOD OF FUEL CONTROL IN ENGINE

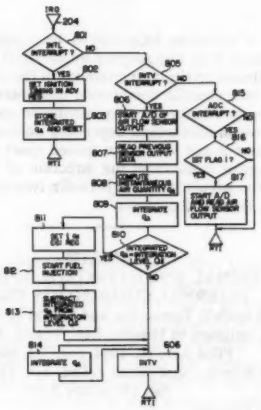
Matsuo Amano; Shinichi Sakamoto, both of Hitachi; Takeshi Hirayama, Mito, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,435

Claims priority, application Japan, Mar. 3, 1982, 57-32345

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—478 **5 Claims**



1. In a fuel control system including:

a plurality of sensors sensing various operation parameters of an engine;

a digital computer for controlling the quantity supplied to the engine depending on the outputs from said sensors;

a pulse generating circuit for generating a pulse signal for controlling the quantity of supplied fuel in response to the output from said digital computer; and

fuel supplying means for supplying fuel on the basis of the pulse signal generated from said pulse generating circuit,

a method of controlling fuel supplied to the engine comprising the steps of:

computing the quantity of air taken into the engine on the basis of the output from one of said sensors;

integrating the quantity of intake air computed in the first step;

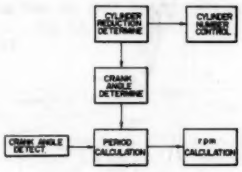
determining the level for setting the period of generation of the pulse signal on the basis of the output from one of said sensors; and

generating pulses of predetermined pulse width from said pulse generating circuit when the integrated value of the quantity of intake air in the second step reaches the level set in the third step such that the period of generation of said pulse and hence the timing of the fuel supply is varied depending on the integrated value and the set level.

4,522,179
ENGINE SPEED DETECTING SYSTEM FOR MULTIPLE-DISPLACEMENT ENGINE

Hirofumi Nishimura; Hiroyuki Oda; Tadashi Kaneko; Akira Takai, and Nobuo Takeuchi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 16, 1984, Ser. No. 641,384
Claims priority, application Japan, Aug. 23, 1983, 58-152387
Int. Cl.³ F02D *17/00*
U.S. Cl. 123—481 7 Claims



1. An engine speed detecting system for a multiple-displacement engine which can be selectively operated in a full-displacement state or in a part-displacement state according to the operating condition of the engine, all the cylinders being fed with fuel in the full-displacement state and fuel supply to a part of the cylinders being cut to make inoperative the cylinder or the cylinders in the part-displacement state, said engine speed detecting system comprising,

a cylinder-reduction determination means for determining whether the engine is to be operated in the full-displacement state or in the part-displacement state,

a cylinder number control means for controlling the operating state of the engine according to an output of the cylinder-reduction determination means,

a crank angle detecting means for generating a signal every predetermined crank angle,

a period calculating means which receives the signals from the crank angle detecting means and calculates the time interval corresponding to the predetermined crank angle,

a crank angle determination means which receives an output of the cylinder-reduction determination means and sets said predetermined crank angle used for calculation of said time interval in the part-displacement state to include a crank angle corresponding to the power stroke of the operative cylinder in the part-displacement state, and

an engine speed calculating means for calculating the engine speed on the basis of the time interval calculated by the period calculating means.

4,522,180
AIR-FUEL RATIO CONTROL APPARATUS

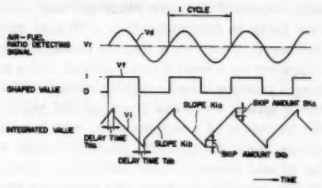
Hiroki Matsuoka, and Toshimi Murai, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1983, Ser. No. 491,643
Claims priority, application Japan, Nov. 12, 1982, 57-197729
Int. Cl.³ F02D *33/00*
U.S. Cl. 123—489 26 Claims

1. An air-fuel ratio control apparatus comprising:

means for generating an air-fuel ratio detecting signal related to the ratio of an air-fuel mixture supplied to a combustion chamber;

processing means for: (1) generating an integrated amount which is increased or decreased in relation to said air-fuel ratio detecting signal on the basis of a parameter value to correct a fuel amount supplied to an intake system, (2) detecting the frequency of said air-fuel ratio detecting signal,



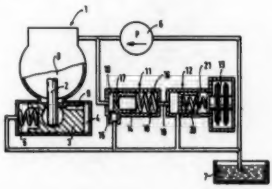
and (3) correcting said parameter value on the basis of the frequency of said air-fuel ratio detecting signal such that the frequency of said air-fuel ratio detecting signal becomes a basic frequency which is a frequency of said air-fuel ratio detecting signal when the air-fuel ratio in said combustion chamber reaches a predetermined value; and

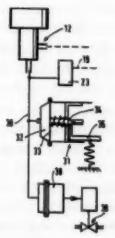
means for controlling the amount of fuel supplied to said intake system on the basis of said integrated amount.

4,522,181
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Max Greiner, Gerlingen, and Karl Konrath, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 410,668, Aug. 23, 1982, Pat. No. 4,475,521.
This application May 9, 1984, Ser. No. 608,632
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138606
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—502 4 Claims





1. A fuel injection pump for internal combustion engines comprising a fuel supply pump driven in synchronism with the fuel injection pump, a pressure side of said fuel supply pump arranged to communicate with a work chamber ahead of an

adusting piston, said adjusting piston serves to adjust the injection onset and is exposed to a restoring force in a chamber connected via a discharge line to a discharge opening, said discharge opening being controlled by a control piston of a pressure control valve including a relief chamber in order to generate an rpm-dependent control pressure at the pressure side of said pressure control valve, said control piston being exposed to a restoring force and further arranged to enclose on one side a control pressure chamber, said control pressure chamber being in communication with said pressure side of said fuel supply pump via a throttle connection and with said relief chamber via a relief line connected with a pressure valve including a housing, a valve closing member which is exposed to a valve spring, the initial stress of said valve spring being variable by means of a support point which is displaceable in accordance with air pressure, in which said valve closing member of said pressure valve comprises a slide means, and a control line branches off from said relief line between a pressure maintenance valve and said pressure valve, said control line leading to an adjusting device for adjusting a fuel injection quantity and to a further adjusting device for affecting an exhaust gas recirculation quantity.

4,522,182

FUEL SYSTEM FOR COMPRESSION IGNITION ENGINE

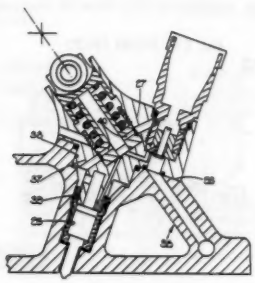
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries plc, Birmingham, England

Filed Jul. 19, 1982, Ser. No. 399,812

Claims priority, application United Kingdom, Jul. 24, 1981, 8122968; Mar. 23, 1982, 8208400

Int. Cl.³ F02M *39/02*

U.S. Cl. 123—509 **3 Claims**



1. A fuel system for a compression ignition engine comprising a body adapted to be mounted on the cylinder head of the engine, a mounting formed integrally with the body, and a fuel injection nozzle carried by said mounting, said fuel injection nozzle extending in use through a bore in the cylinder head into a combustion space of the engine, an injection pump including a reciprocable plunger accommodated in the body, the line of action of the plunger being out of line with the axis of the nozzle, and a surface defined on said body for engagement with a complementary surface on the cylinder head of the engine, said surface acting to transmit to the cylinder head at least some of the forces to which the body is subjected during operation of the pump, said body defining a second surface which extends substantially at right angles to the axis of the nozzle, said second surface being clamped in use to a further surface on the cylinder head of the engine, said first mentioned surface on the body extending substantially at right angles to said second surface.

4,522,183

METHOD FOR CONVERTING A RETROGRADE SUBSTANCE TO THE GASEOUS STATE

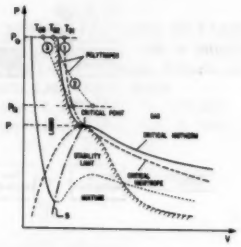
Gerd E. A. Meier, Goettingen, Fed. Rep. of Germany, and Philip A. Thompson, Arlington, Va., assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 984, Jan. 4, 1979, abandoned. This application Nov. 1, 1983, Ser. No. 548,011

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1978, 2800894

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—558 **15 Claims**



1. Method for abruptly converting a retrograde substance having a characteristic specific heat $\hat{c}_v > 11.2$ from a liquid to a gaseous state, comprising reducing the pressure on the liquid polytropically with the addition of heat from an initial state of elevated pressure of 0.5 to 16 bar and corresponding to a point in the region of a pressure-volume diagram of the substance which lies to the lower volume side of a boundary formed by the branch of the critical isentrope of the substance extending from the critical point to higher pressures and by the stability limit of the substance, to a final state which corresponds to a point on the greater volume side of said boundary, wherein the stability limit defines the locus of the points on isentropes corresponding to a plurality of initial states, the exceeding of which in the direction toward greater volumes causes the liquid state of the retrograde substance to become unstable, said locus of points passing through the critical point and intersecting each isentrope approximately at the point of minimum pressure for each isentrope.

4,522,184

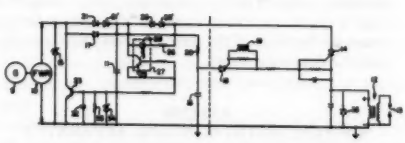
SILICON CONTROLLED RECTIFIER SHUT-OFF CIRCUIT FOR CAPACITIVE DISCHARGE IGNITION SYSTEM

Joseph M. Lepley, Youngstown, Ohio, assignor to Altronic, Inc., Youngstown, Ohio

Filed Apr. 23, 1984, Ser. No. 603,162

Int. Cl.³ F02P *3/08*

U.S. Cl. 123—599 **9 Claims**



1. A capacitive discharge ignition system for an internal combustion engine and for use with a generator powered current source comprising a storage capacitor charged through a diode, at least one thyristor for discharging the storage capacitor to transfer energy to at least one spark plug and a trigger circuit for gating the at least one thyristor in

synchronism with an internal combustion engine with which the ignition system may be associated,

the improvement comprising

(a) the storage capacitor being discharged through a diode circuit,

(b) a circuit for sensing flow in the discharge diode circuit and generating a discharge signal indicative thereof,

(c) a solid state device for switching the output of the generator to ground, and

(d) a means for gating the solid state device into conduction in response to said discharge signal.

4,522,185

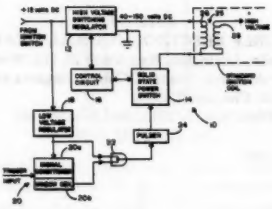
SWITCHING ELECTRONIC IGNITION

Minh-Tri Nguyen, 2602 S. Pacific Ave., Santa Ana, Calif. 92704

Filed Nov. 14, 1983, Ser. No. 551,060

Int. Cl.³ F02P *15/08*

U.S. Cl. 123—637 **16 Claims**



1. An electronic ignition system for automobile engines and the like, the engines of the type that employ a battery and at least one spark plug for responding to a trigger source for igniting a fuel mixture as a result of a high voltage derived from the battery and applied to the spark plug through an ignition coil; the ignition system comprising:

a switching regulator having an input connected to said battery and an output of high voltage than available from said battery connected to the primary winding of said ignition coil,

a power switch connected to said primary winding and activated for selectively connecting said winding to ground potential for generating a sufficient current in said winding to spark said spark plug with sparks of substantially constant voltage and current,

a pulser for generating pulses at a constant frequency and connected to said power switch for activating said switch upon the occurrence of each pulse generated by said pulser, and

a signal conditioner and window generator having an input connected to said trigger source and an output connected to said pulser for responding to said trigger source by activating said pulser for a period of time that is inversely proportional to engine speed.

4,522,186

IGNITION CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Atsushi Hashizume, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,269

Claims priority, application Japan, Dec. 16, 1982, 57-222524

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—643 **5 Claims**

1. An ignition circuit for an internal combustion engine comprising:

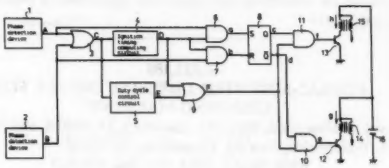
igniting means;

at least two phase detection means associated respectively with at least two cylinders for producing phase signals corresponding to phase of relative motion of respective pistons within the cylinders,

first gate means for producing time sequential pulse signals by combining said phase signals,

ignition timing computing circuit for developing a signal defining ignition timing corresponding to engine operation parameters,

a duty cycle control circuit for developing a signal for controlling duty cycle of primary current pulses for said igniting means,



a flip-flop alternately set and reset in response to output signal pulses of said ignition timing computing circuit,

at least two other gates responsive to the outputs of said duty cycle control circuit and said flip-flop for distributing pulses from said duty cycle control circuit to said at least two cylinders, said pulses being synchronized to said flip-flop output, and,

at least two switching devices to be controlled by said igniting output pulses of said corresponding one of said at least two other gates for switching primary currents of said ignition coils.

4,522,187

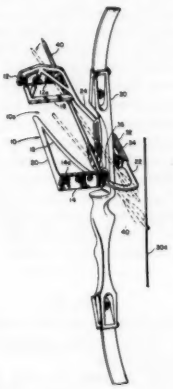
ARCHERY QUIVER AND METHOD

William G. Tafel, 2702 Trindal St., Eau Claire, Wis. 54701

Filed Apr. 25, 1983, Ser. No. 487,968

Int. Cl.³ F41B *5/00, 5/06*

U.S. Cl. 124—24 A **14 Claims**



1. In combination with a bow having a front convex side and a rear concave side with a bow string connected to the ends thereof and positioned on the concave rear side of the bow and an arrow rest located on a projection side of the bow where the arrow is located during the drawing, sighting, and releasing operations, a bow-mounted quiver adapted to provide a supply of arrows positioned in close proximity to the sighting and projection path of arrows to permit rapid fire shooting of all arrows stored in the quiver, said quiver comprising,

a magazine having a tip arrow-holding clip member with

arrow-holding recesses formed therein and a bottom clip member spaced below said top clip member and having arrow-holding recesses formed therein, said top clip member being disposed, when mounting on a bow, in forwardly and upwardly spaced relation to said bottom clip member with both of said clip members being cantilevered from the projection or arrow rest side of the bow to provide clearance for shifting arrows from their recesses on said magazine toward the projection side of the bow into sighting projection position when released from said clip members prior to notching of an arrow, and

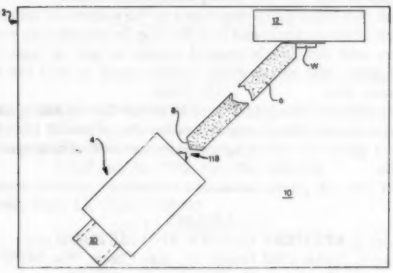
means for mounting said magazine in operative position on said bow.

4,522,188

GIMBAL-MOUNTED DRESSING DEVICE FOR GRINDING MACHINE

Royal E. Houghton, Box 113, Ascutney, Vt. 05030, and Stanley J. Walasewicz, Box 84, Cavendish, Vt. 05142

Filed Sep. 7, 1982, Ser. No. 415,633
Int. Cl.³ B24B *53/06*
U.S. Cl. 125—11 CC **9 Claims**



1. In a dressing device for dressing a grinding wheel having a working face comprised of intersecting substantially planar working surfaces defining a working face included angle therebetween, the combination of a gimbal means from which a dresser means is suspended and swung about two intersecting axes defining therebetween an included angle substantially equal to said working face included angle, said dresser means including a twin point dresser with the points oriented relative to the working surfaces such that swinging of the gimbal means about one axis causes one dresser point to swing in a plane to dress one working surface and about the other axis causes the other dresser point to swing in a plane to dress the other working surface, and cam means on the gimbal means for actuating said gimbal means to swing said dresser means successively about one of said axes and then the other so as to dress the working surfaces one at a time.

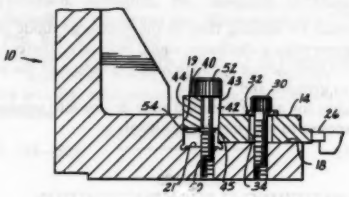
4,522,189

ADJUSTABLE CAM BAR ASSEMBLY

James D. Phillips, Posen, Mich., assignor to J. D. Phillips Corporation, Alpena, Mich.

Filed Jul. 28, 1983, Ser. No. 517,998
Int. Cl.³ B29B *53/00*
U.S. Cl. 125—11 TP **5 Claims**

1. An adjustable cam bar assembly for use in guiding a dresser for the grinding wheels of a multi-wheel grinder or the like, comprising a support having an elongated cam support surface and an abutment surface disposed at a substantial angle to said support surface, a plurality of cams on said support surface along the length thereof, each cam having a contoured surface on the side thereof remote from said abutment surface adapted to be engaged by the stylus of a dresser in a dressing operation, and means for individually mounting each cam on said support surface in transversely adjusted position in which its contoured surface projects a predetermined distance from said abutment surface and each cam and capable of being advanced or



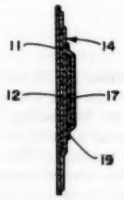
retracted to precisely locate said cam in adjusted position, means for individually advancing and retracting each wedge, and means for clamping each cam in adjusted position.

4,522,190

FLEXIBLE ELECTROCHEMICAL HEATER

William E. Kuhn, Lexington, Ky.; Kwoh H. Hu, Weston, Mass., and Stanley A. Black, Ventura, Calif., assignors to University of Cincinnati, Cincinnati, Ohio

Filed Nov. 3, 1983, Ser. No. 548,541
Int. Cl.³ F24J *1/00*
U.S. Cl. 126—263 **25 Claims**



1. An electrochemical heating device capable of generating heat at a controlled rate, comprising:

a. a container adapted to be placed against an article so as to transfer heat developed within the container to the article;

b. at least one stand-alone flexible heating element disposed within said container;

c. said flexible heating element comprising a totally integrated sintered composite structure of blended powdered polymeric material and supercorroding metallic alloy powders dispersed throughout in the form of a porous matrix;

d. means for sealing said container, making the container air-impermeable;

e. said flexible heating element being operable to be wetted and activated with an electrolyte to generate heat through electrochemical reactions.

4,522,191

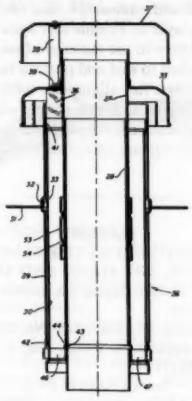
NON-PULL APART TELESCOPING ROOF JACK ASSEMBLY FOR FURNACE

Joe E. Knowles, and Mellie E. Winters, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jan. 11, 1984, Ser. No. 569,918
Int. Cl.³ F23J *11/00*
U.S. Cl. 126—307 R **6 Claims**

1. A roof jack assembly for a furnace comprising a first pair of outer telescoping tubes, a second pair of inner telescoping tubes positioned generally concentrically within the outer tubes, connecting means extending between one of the outer tubes and one of the inner tubes for causing the tubes to move

together in an axial direction while permitting relative transverse movement between the tubes and means on at least one of said pairs of telescoping tubes for preventing the tubes of said one pair from being separated said connecting means



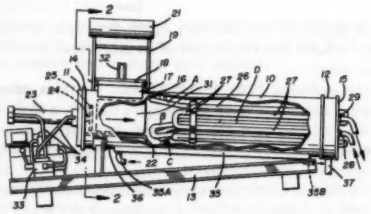
comprising at least one connecting member extending generally radially between one of the outer tubes and one of the inner tubes and extending slidably through an opening in one of said tubes.

4,522,192

EXTRUDER MELTER APPARATUS

John H. Miller, Youngstown, Ohio, assignor to Hy-Way Heat Systems, Inc., Youngstown, Ohio

Filed Jan. 23, 1984, Ser. No. 573,286
Int. Cl.³ F01C *19/45;* **F27B** *3/06*
U.S. Cl. 126—343.5 A **9 Claims**



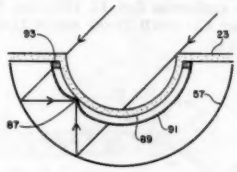
1. An extruder melter comprising an elongated tank with side and end walls, a central aperture in one of said end walls and a plurality of apertures in the other of said end walls, an access port in said tank adjacent said end wall having said central aperture, several elongated U-shaped heat transfer coils positioned in said tank longitudinally thereof and extending from said other end wall and in communication with said apertures therein and with one another and with a source of heating fluid, some of said heat transfer coils positioned in circumferentially spaced relation to one another and radially with respect to the center of said tank and at least one of said heat transfer coils positioned in the center of said tank, a ram consisting of a piston and cylinder mounted adjacent said central aperture in said one end wall of said tank, said piston movable into said tank toward and away from said heat transfer coils so as to engage and move solid meltable material positioned in said tank through said access port into and against said heat transfer coils, an outlet port in said tank for removing said meltable material when melted from said tank.

4,522,193

SOLAR COLLECTOR DEVICE

Kenneth N. Bates, 27765 Lupine Rd., Los Altos Hills, Calif. 94022

Division of Ser. No. 365,946, Apr. 6, 1982, Pat. No. 4,473,065, which is a division of Ser. No. 203,258, Nov. 3, 1980, abandoned. This application Mar. 2, 1984, Ser. No. 585,660
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—438 **12 Claims**



1. A device for collecting solar radiation comprising:

collecting means for conversion of solar radiation to another form of energy, said collecting means having a collecting region which is more highly absorptive of solar radiation when the radiation is focussed there than other regions of said collecting means where the radiation is not focussed;

focussing means positioned in spacial relationship with said collecting means for focussing solar radiation on said collecting region at all times of day, without necessitating motion during said day of said focussing means or said collecting means;

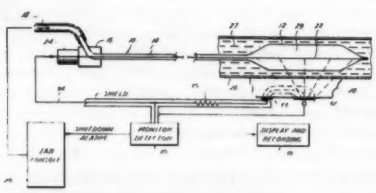
mechanical heat transferring means spaced apart from said collecting means for moving into contact with said collecting means in an area of contact in said collecting region where said radiation is focussed and in response to said focussed radiation, said area of contact moving continuously and maintaining uninterupted contact between said mechanical heat transferring means and said collecting means during the day as the sun moves.

4,522,194

METHOD AND AN APPARATUS FOR INTRA-AORTIC BALLOON MONITORING AND LEAK DETECTION

Nils A. Normann, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 467,623, Feb. 18, 1983, abandoned. This application Jun. 10, 1983, Ser. No. 503,117
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—1 D **19 Claims**



1. An apparatus for monitoring the operation of an intra-aortic balloon inserted into the aorta of a body in which the balloon includes an electrical conductor therein for extending out of the body comprising,

an intra-aortic balloon for inserting into the aorta of a body,

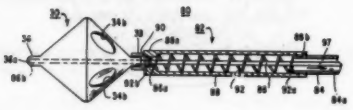
said balloon including an electrically conductor therein for extending out of the body,
an electrode affixed to the exterior of the body,
an electrical current source connected to the electrode and to the electrical conductor, and
an impedance measuring means electrically connected to the electrode and the electrical conductor for measuring the impedance of the balloon for monitoring its operation.

4,522,195

APPARATUS FOR LEFT HEART ASSIST

Peter Schiff, Rte. 7, Cookeville, Tenn. 38501

Division of Ser. No. 267,374, May 25, 1981, Pat. No. 4,407,271, which is a continuation-in-part of Ser. No. 172,753, Jul. 28, 1980,. This application Jun. 13, 1983, Ser. No. 503,527
Int. Cl.³ A61B *19/00*; A61M *25/00*
U.S. Cl. 128—1 D **13 Claims**



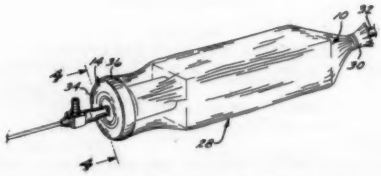
1. Mechanical blood pumping apparatus for assisting in the pumping function of the heart comprising:
a blood pumping element within a femoral artery of the patient to be treated;
slender coupling means having a first end coupled to said pumping element and having a second end extending outside of the body of the patient being treated; and
drive means connected to the second end of said coupling means for reciprocally moving said pumping element in said femoral artery between a start position and a position displaced from the start position to assist the pumping function of the heart;
first coupling means for resiliently coupling said coupling means to said pumping element; and
second coupling means for resiliently coupling said coupling means to said drive means.

4,522,196

REUSABLE, STERILE COVERING FOR A SURGICAL CAMERA

Frank W. Cunningham, 1801 Via Estudillo, Palos Verdes Estates, Calif. 90274, and David Weir, 1602 Royce St., Camarillo, Calif. 93010

Continuation of Ser. No. 387,353, Jun. 11, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,683
Int. Cl.³ A61B *1/00*
U.S. Cl. 128—4 **8 Claims**



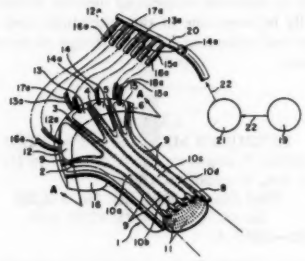
1. A sterile covering for use in combination with an endoscope and a camera having a lens-to-endoscope coupling characterized by a cavity adapted to receive one end of said endoscope adjacent the base of said cavity, said coupling being operative to temporarily couple said endoscope within said cavity, said covering comprising:
a flexible body portion for covering said camera; and
an end portion attached to said body portion and made of material which is rigid relative to the flexible material of said body portion for repeated insertion into and withdrawal from said cavity without losing its shape, said end portion including an end portion base for location adjacent the base of said cavity, said end portion base having an optically clear central section for providing a clear optical path between said camera and said endoscope, said end portion base further including a layer of flexible and optically clear material which is thin relative to the material of said end portion, said layer being attached to said end portion base in registry with said central section for alignment with the optical path between said camera and endoscope whereby said endoscope may be successively coupled and decoupled from said coupling without contamination of said endoscope by said camera.

4,522,197

GLOVES FOR RECOVERING THE FUNCTIONS OF THE CARPAL JOINT, THE HAND AND THE FINGERS

Tsuneo Hasegawa, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,232
Claims priority, application Japan, Aug. 11, 1982, 57-138467; Jun. 10, 1983, 58-102717
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—26 **13 Claims**



1. A glove for the recovery of the functions of the carpal joint, the hand and the fingers of an individual, comprising in combination:
a glove-shaped body including stall portions adapted to separately receive an individual's fingers, a main portion adapted to cover the palm and back of an individual's hand, and an arm portion adapted to cover the forearm including the carpal joint;
a plurality of fanning sacs interposed between the respective stall portions for effecting fanning of the respective fingers;
a plurality of extension sacs arranged on the palm portion for effecting extension of the fingers, the hand and the carpal joint, said extension sacs extending from said stall portions toward and along said arm portion; and
a plurality of compressed air charge/discharge tubes connected to all of said fanning and extension sacs, for supplying compressed air simultaneously or selectively into all of said fanning and extension sacs or specific fanning and extension sacs through said tubes, and for discharging the compressed air after the lapse of a predetermined time;
whereby repeated charging and discharging of compressed air passively effect rhythmical and intermittent movement, such as fanning and extension, of the functionally disordered carpal joint, hand and fingers for the recovery of flexion contraction and extension disorder, and gives rise to a primary factor which can induce active movement.

4,522,198
PENILE PROSTHESIS

Gerald W. Timm, Minneapolis; Donald L. Sandford, Lauderdale; Timothy J. Claude, Coon Rapids, and Richard A. Helms, Elk River, all of Minn., assignors to Dacomed Corporation, Minneapolis, Minn.

Filed Apr. 18, 1983, Ser. No. 485,648
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 **6 Claims**

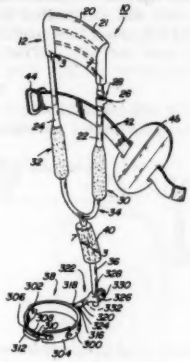
1. A penile prosthesis, comprising:
a. a first end;
b. a second end;
c. an outer elongated sheath formed from physiologically inert and pliable material;
d. an articulated column of segments having slidable joints therebetween and enclosed within said sheath;
e. switch means for switching the prosthesis between a rigid condition and a flaccid condition, said switch means disposed intermediate of said articulated column and the first end of the prosthesis and enclosed within said sheath, said switch means including an axially slidable portion interconnected to a first end of elongated tension means which is fixedly secured at a second end proximate the second end of the prosthesis; said tension means cooperating with said articulated column for imparting rigidity to said prosthesis when said articulated column is compressed and said tension means is in a tensioned condition, and for imparting flexibility to said prosthesis when said tension means is in an untensioned condition and said articulated column is not compressed, said switch means having first and second operative states, said switch means compressing said articulated column and placing said tension means in a tensioned condition when in said first state and placing said tension means in an untensioned condition and said articulated column in a noncompressed state when in said second state; and
f. said switch means being alternately switched from one state to the other by axial displacement of the first end of said tension means under user control.

4,522,199
BODY WEIGHT SUPPORT SYSTEM

Thomas P. Waddell, 1306 Broadview West, Downingtown, Pa. 19335, and Robin Renzetti, Coatesville, Pa., assignors to Thomas P. Waddell, Downingtown, Pa.

Filed Aug. 11, 1983, Ser. No. 521,965
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 G **45 Claims**

1. A body weight support system for releasable securement to at least one leg of a person, comprising upper support means, lower support means and flexure means, said upper support means extending along the thigh and terminating at its upper end adjacent the buttocks-high interface to form a seat and terminating at its lower end adjacent the knee, said lower support means extending along the calf and terminating at its upper end adjacent the knee and at its lower end adjacent the foot, said flexure means being located adjacent said knee and being connected between said upper and lower support means, said flexure means being adjustable for permitting the person to repeatedly freely bend and unbend said knee through any angular range up to a predetermined angle of bend at which a resistance exists to further flexure, said upper and lower support means including securement means for releasably securing said system to said leg, characterized by tensioning means for setting said predetermined angle of bend and energy dampening means separate from said tensioning means for establishing a resistance to movement of said flexure means beyond said

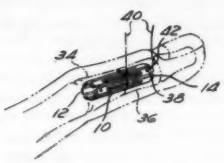


predetermined angle and for permitting dampened flexure beyond said predetermined angle to absorb shocks transmitted to the body of the wearer.

4,522,200
ADJUSTABLE INTRAMEDULLAR ROD

Denis P. Stednitz, Redondo Beach, Calif., assignor to ACE Orthopedic Company, Los Angeles, Calif.

Filed Jun. 10, 1983, Ser. No. 502,923
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BC **4 Claims**



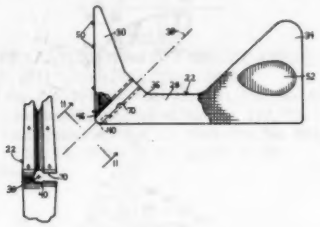
1. An intramedullar rod for use in orthopedic surgery for setting broken hand and foot bones comprising a single unitary substantially right cylindrical body of biologically compatible resilient metal, having substantially smooth uniform interior and exterior surfaces, the cylinder having first and second ends and having formed in the cylinder walls at least four slots, at least two of said slots extending from the first end more than one-half the distance toward the second end, and two of said slots extending from the second end more than one-half the distance toward the first end, the slots being substantially equally spaced from one another alternating from the respective ends substantially symmetrically about the circumference of the cylindrical body, the cylindrical body being formed of a single piece of resilient metal, and being so configured and constructed as to be compressible diametrically, and to exert a resilient force to return toward a predetermined noncompressed diameter, whereby when in use inserted in the medullar cavity of mating ends of a fractured bone, the cylindrical body exerts a constant, resilient force outwardly against the interior of such fractured bone without the use of other implements.

4,522,201

ORTHOPEDIC SURGERY DRILL GUIDE APPARATUS

John R. Tongue, 111 "C" Ave., Lake Oswego, Oreg. 97043

Filed Apr. 14, 1983, Ser. No. 485,047
Int. Cl.[3] A61F *5/04*
U.S. Cl. 128—92 EB 4 Claims



1. Orthopedic surgical guide apparatus for use in the preparation of a fractured bone, such as a hip bone, in an orthopedic procedure requiring the drilling along a common axis of two different-diameter bores in such a bone, said apparatus comprising

a first guide element having means defining a generally planar support surface for seating against such a bone, and means defining a first guide bore which opens to said surface with an axis disposed at a predetermined angle relative to the plane of said support surface for receiving and clearance-guiding a drill having a diameter equaling the larger of such two different diameters, and

a second guide element having an elongate cylindrical body portion removably-clearance-fittable within said first guide bore, and a second guide bore extending axially centrally through said body portion for receiving and clearance-guiding a drill having a diameter equaling the smaller of such two different diameters,

said first guide element further including a drill escape aperture communicating with and extending laterally relative to the axis of said first guide bore.

4,522,202

CURVED INTRAMEDULLARY LOWER LEG SPIKE

Wolf-Dieter Otte; Heinz Otte, both of Volkach, Fed. Rep. of Germany, and Siegfried Schider, Reutte, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Continuation of Ser. No. 338,376, Jan. 11, 1982, abandoned. This application Dec. 29, 1983, Ser. No. 566,740
Claims priority, application Austria, Jan. 12, 1981, 72/81
Int. Cl.[3] A61F *5/46*
U.S. Cl. 128—92 BC 7 Claims

1. A curved, unitary intramedullary, lower leg spike suitable for being driven laterally at an acute angle with respect to the longitudinal axis of a bone, into a spike-receiving duct in said bone, said spike comprising a longitudinal portion, a curved portion, a striking end, and a shaped outer surface which extends along said longitudinal portion up to said striking end, said shaped outer surface being adapted to provide stability against twisting, said striking end having structured elements for actively engaging a driving tool to said spike, and further defining an exposed face area wherein a line drawn in a plane which lies across said face area and which intersects the front planar surface of said spike forms an acute angle with the longitudinal axis of said spike at said striking end, said spike

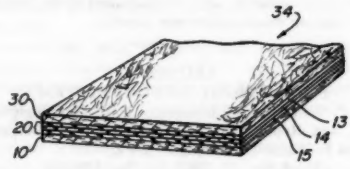
being adapted to contact corticalis along said outer surface up to said striking end.

4,522,203

WATER IMPERVIOUS MATERIALS

Alfred T. Mays, East Windsor, N.J., assignor to Chicopee, New Brunswick, N.J.

Filed Mar. 9, 1984, Ser. No. 588,037
Int. Cl.[3] A61F *13/00;* A61M *15/08;* B32B *27/00;* D04H *1/04*
U.S. Cl. 128—132 D 9 Claims



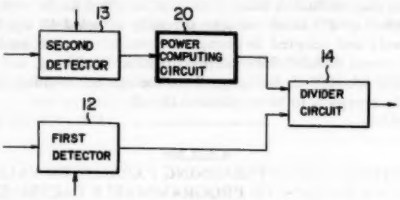
1. A water impervious laminated material comprising an inner plastic film sandwiched between two layers of conjugate fibers, each of said layers of conjugate fibers having a first face and an opposite face, said conjugate fibers being composed of a lower melting component and a higher melting component, wherein a substantial proportion of the surfaces of said fibers comprises said lower melting component, said plastic film comprising a three-layer structure having an inner layer sandwiched between and bonded to two outer layers, said inner layer of said film structure having a melt temperature higher than the melt temperatures of each of said outer layers of said film structure, said lower melting components of both layers of said conjugate fibers which lie on said first faces having been fuse bonded to the adjacent outer layers of said film structure at a temperature below the melt temperature of said higher melting component of said fibers, so that the latter component retains its initial fiber-like integrity.

4,522,204

RESPIRATORY GAS CONCENTRATION MEASURING APPARATUS

Muneshige Kurahashi, Saitama, and Shinji Yamamori, Tokyo, both of Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,133
Claims priority, application Japan, Jun. 22, 1982, 57-106174
Int. Cl.³ A61B 5/00
U.S. Cl. 128—719 1 Claim



1. A system for measuring the concentration of a respiratory gas that absorbs light having a first wavelength, including:

(a) a connector tube having an open first end for receiving the respiratory gas, an opposite open end, and an air-tight window between ends;

(b) a light source located adjacent a first side of the window for directing light through said window;

(c) a chopper located adjacent a second side of the window in the path of the light directed through the window, including

(1) at least one first filter means for passing through the light of a first wavelength from said light source, and

(2) at least one second filter means for passing through the light from said light source of a wavelength that is not absorbed by said respiratory gas;

(d) motor means connected to the chopper to position said first and second filter means alternately in said light path;

(e) a photodetector means located adjacent the chopper for receiving light passing therethrough and converting the light having passed through said filter means into a first electric signal;

(F) a first detector means connected to the photodetector means for receiving the first electric signal therefrom and operated synchronously with said motor means for generating a second electric signal indicative of the amount of light passing through the first filter means;

(g) a second detector means connected to the photodetector means for receiving the first electric signal therefrom and operated synchronously with said motor means generating a third electric signal indicative of the amount of light passing through the second filter means; the improvement comprising:

(h) a power computing circuit means connected to the second detector means for receiving the third electric signal therefrom and generating a fourth electric signal equal to the third electric signal raised to a preset mth power, m being the ratio between

(1) a temperature-dependent coefficient $\theta_1$of the second electric signal which varies exponentially with a temperature variation, and

(2) a temperature-dependent coefficient θ_2 of the third electric signal which varies exponentially with a temperature variation; and

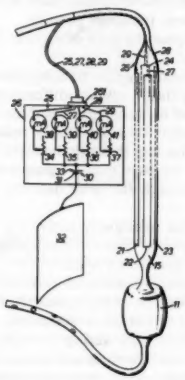
(i) a divider circuit means connected to the first detector means and the power computing circuit means for receiving the second and fourth electric signals and dividing the second electric signal by the fourth electric signal to produce a temperature independent electric signal indicative of the concentration of the respiratory gas in the connector tube.

4,522,205

THERAPEUTIC DEVICE AND METHOD OF INDUCING THROMBOSIS IN A BLOOD VESSEL

Thomas V. Taylor, Altrincham, England, and James M. Neilson, Edinburgh, Scotland, assignors to The University Court of The University of Edinburgh, Edinburgh, Scotland

PCT No. PCT/GB81/00176, § 371 Date May 3, 1982, § 102(e) Date May 3, 1982, PCT Pub. No. WO82/00768, PCT Pub. Date Mar. 18, 1982
PCT Filed Sep. 3, 1981, Ser. No. 375,287
Claims priority, application United Kingdom, Sep. 3, 1980, 8028356
Int. Cl.³ A61N 1/04
U.S. Cl. 128—303.17 22 Claims



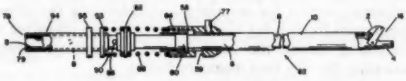
1. Apparatus for inducing thrombosis in a blood vessel in surface tissue at a particular site on a living human or animal body, comprising a therapeutic electrode in the form of an inflatable balloon having an electrically conductive surface area, wherein inflation of the balloon maintains said surface area, by fluid pressure, in contact with the tissue, a counter-electrode separate from the balloon, and a source of time-steady direct electrical current for connection to the therapeutic electrode as anode and the counter-electrode, as cathode wherein said therapeutic electrode is adapted to be inflated to a gauge pressure of at least 30 mm Hg, and comprises at least two spaced, electrically conductive electrode elements, each including an individual connection to said source of direct current, and wherein the apparatus includes means to monitor and adjust the current flowing through each electrode element such that the current density at the surface of any electrode element can be made equal to the current density at the surface of any other electrode element.

4,522,206

SURGICAL INSTRUMENT

Terry L. Whipple, Richmond, Va., and Douglas D. Sjostrom, Wakefield, Mass., assignors to Dyonics, Inc., Andover, Mass.

Filed Jan. 26, 1983, Ser. No. 461,251
Int. Cl.³ A61B 17/16
U.S. Cl. 128—312 18 Claims



16. A surgical instrument suitable for cutting a range of body tissue including cartilagenous tissue and the like, comprising an axially elongated support,

at the distal end thereof, first and second, opposed cutting jaws, at least one of said jaws being pivotable about a pivot axis disposed generally transversely to the axis of said elongated support,

said jaws constructed and arranged, when open, to provide a distally directed end aperture through which tissue can enter, and said jaws closable by an actuator to cut tissue extending through said end aperture into the space between said distal jaws,

said jaws being cooperatively constructed to provide an open throat between proximal portions of said jaws,

said elongated support defining an open, tissue fragment transport, suction passage extending through the length of said support,

a suction line connector associated with the proximal end of said fragment transport passage,

means to by-pass the path of suction from said suction connector, and

means for selectively deactivating the suction by-pass means to cause a fluid pressure differential to act through the distal end of the instrument, and for activating said suction by-pass means to substantially reduce the fluid pressure differential acting through the distal end of the instrument,

said suction by-pass means comprising at least one port defined through the wall defining said suction passage, and

said means for selectively activating and deactivating the suction by-pass means comprising a sleeve moveably positioned about said wall,

said sleeve being positioned relative to said ports by the selective position of the actuator of said jaws,

said jaws and throat constructed and arranged so that fluid differential pressure acting through the distal end of said instrument and through said throat and transport passage causes a fragment of tissue cut by said jaw closing action to be drawn from between said jaws, and transported through said open throat and fragment transport passage, and out of said instrument via said connector,

whereby said fragment can be removed while said instrument can remain in situ for repeated cutting cycles.

4,522,207

SPRING ACTIVATED HEMOSTATIC CLIP APPLICATOR

Charles H. Klieman, 3737 E. Century Blvd., Lynwood, Calif. 90262, and Richard M. Densmore, Fountain Valley, Calif., assignors to Charles H. Klieman, Los Angeles, Calif.

Continuation-in-part of Ser. No. 231,976, Feb. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 183,360, Sep. 2, 1980, Pat. No. 4,325,376, which is a continuation of Ser. No. 822,076, Aug. 5, 1977, abandoned. This application Oct. 6, 1982, Ser. No. 433,028

Int. Cl.³ A61B *17/12;* **B31B** *1/00*

U.S. Cl. 128—325 **13 Claims**

1. In a surgical clip applying device of the type having a main body, a clip magazine for holding a plurality of clips, clip deforming means for receiving and deforming the clips, clip feed means for moving the clips from the clip magazine to the deforming means, the improvement comprising, means for actuating the clip feed means including

(i) two handle portions; and

(ii) energizing means coupled to the main body, the clip feed means and one handle portion, for storing energy and selectively supplying the energy to the clip feed means, said energizing means including a camming surface coupled to said one handle portion, a cam follower, and a spring coupled to the main body, the cam follower and the clip feed means wherein movement of said one handle portion with respect to the other handle portion causes the camming surface to engage the cam follower and flex the spring thereby storing energy in the spring, and a subsequent movement of said one handle portion with respect to the other handle portion causes the energizing means to supply the energy stored in the spring to the clip feed means so as to cause a clip to be moved rapidly from the clip magazine to the clip deforming means and wherein the energizing means further includes a ratchet member coupled to the cam follower and a latch member pivotally coupled to the main body and adapted to engage the ratchet member so as to prevent release of the energy stored in the spring, and further adapted to disengage from the ratchet member when the energy is to be supplied to the clip feed means.

4,522,208

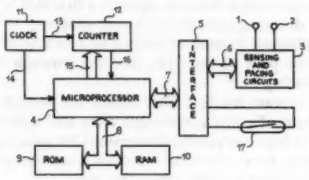
METHOD FOR DETERMINING PARAMETER VALUES OF AN IMPLANTED PROGRAMMABLE PACEMAKER

Jacques Buffet, Le Raincy, France, assignor to Cardiofrance Compagnie Francaise D'Electrocardiologie, Le Grand, France

Continuation-in-part of Ser. No. 254,860, Apr. 16, 1981, abandoned. This application Feb. 24, 1984, Ser. No. 583,578

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PT **3 Claims**



1. A method of determining the values of the programmable parameters of an implanted programmable pacemaker, comprising:

operating the pacemaker in asynchronous mode with a pacing period T;

assigning to each parameter value a time ΔT which is a fraction of the period T;

in a pair of successive pacing intervals with the combined duration of 2T shortening one interval and lengthening the other by the amount ΔT; and

comparing the relative lengths of said intervals, thereby identifying the parameter value.

4,522,209

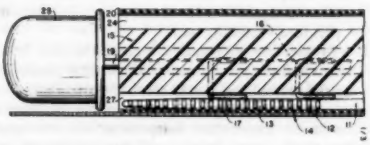
COCHLEAR PROSTHESIS TEST SYSTEM

James F. Patrick, Lane Cove; Peter A. Crosby, Drummoyne; Janusz A. Kuzma, Stanmore, and David K. Money, Pennant Hills, all of Australia, assignors to The Commonwealth of Australia, Australia

Filed Apr. 11, 1983, Ser. No. 483,862

Int. Cl.³ A61N *1/00*

U.S. Cl. 128—419 R **20 Claims**



1. A test system comprising a sealed sterile package, said

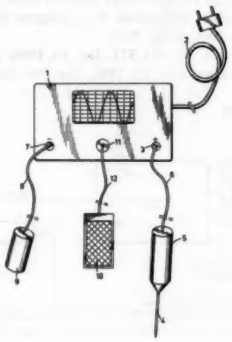
package containing a medical device whose proper operation is to be verified prior to opening of the package; means in said package, not forming part of said medical device, for indicating the status of said medical device when said medical device is operated; means for connecting said indicating means to said medical device; and means for enabling operation of said medical device while it is in said package prior to the opening thereof.

4,522,210

METHOD OF SKIN TREATMENT AND DEVICE FOR CARRYING OUT THE SAID METHOD

Philippe Simonin, 30 Allée Horace, Vernet 78170 La Celle St. Cloud, France

Filed Mar. 23, 1983, Ser. No. 478,025
Claims priority, application France, Apr. 2, 1982, 82 05796
Int. Cl.³ A61N *1/00*
U.S. Cl. 128—421 **4 Claims**



1. Method for the aesthetic treatment of wrinkled or puckered skin having depressions from the wrinkle or pucker to remove such wrinkles and puckers from the skin, which comprises introducing a needle immediately under the skin and in substantially parallel relationship to the wrinkle or pucker to be removed, said needle being connected to a positive terminal of a low frequency generator having a current return electrode connected to the negative terminal thereof, and passing a low frequency current of between about 100 and 500 cps through said needle for a time sufficient to effect filling of the depression of the wrinkle or pucker, thus improving the aesthetic appearance of the skin.

4,522,211

MEDICAL ELECTRODE CONSTRUCTION

Rex O. Bare, and Earl F. Robinson, both of Lawerance, Kans., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 100,904, Dec. 6, 1979, Pat. No. 4,365,634. This application Oct. 9, 1981, Ser. No. 310,118
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—640 **11 Claims**

1. In combination, a disposable medical electrode and a conductor element in the form of a lead wire having a connector assembly on one end thereof, said electrode including; a support arrangement having an adhesive coating on at least one surface portion thereof for attachment of the electrode to the skin of a patient; a terminal member affixed to the other surface portion of said support arrangement in the form of a plastic-like semi-flexible sheet, said sheet having a first, terminal carrying segment of an area considerably less than that of the support arrangement surface portion to which it is attached such that the periphery of said first segment is disposed inwardly of the periphery of said support arrangement, and an elongate tab segment extending from said first, terminal carrying segment and terminating within the periphery of said support arrangement; a conductive pattern formed on said terminal member including a terminal portion on said first segment and a conductive portion in association with said terminal portion and extending along said tab segment; an annular coating of adhesive on said first, terminal carrying segment attaching said terminal member to the support arrangement, said annular adhesive coating surrounding said terminal portion, and said adhesive coating overlying said conductive portion inwardly of the tab segment thereby to prevent the migration of moisture along said conductive portion, said annular adhesive coating terminating within the periphery of said first,

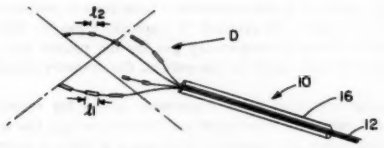
terminal carrying segment thereby leaving said tab segment free of attachment to said support arrangement for engagement thereof with said connector assembly; said tab segment further including at least one aperture formed therein; said lead wire connector assembly including a housing, a metal terminal member disposed within said housing, and a protuberance formed on said housing and engaged with said aperture in said tab segment, such that upon assembly, said tab segment is disposed in said housing, with said metal terminal member in engagement with the conductive portion on said tab segment, and said connector assembly protuberance is engaged in said aperture of the tab segment to prevent inadvertent disconnection of said connector assembly and said electrode.

4,522,212

ENDOCARDIAL ELECTRODE

Sandra L. Gelinas, North Attleboro; Daniel G. Cerundolo, Hingham, and John E. Abele, Concord, all of Mass., assignors to Mansfield Scientific, Inc., Mansfield, Mass.

Filed Nov. 14, 1983, Ser. No. 551,243
Int. Cl.³ A61D *5/04*
U.S. Cl. 128—642 **16 Claims**



1. An endocardial electrode assembly, said assembly comprising three or more elongated insulated wire spring legs joined together at least in a region spaced from the distal end of said assembly, said assembly constructed to be inserted into the heart while surrounded by a distal portion of a catheter, and to be exposed to active position by proximal movement of the catheter to a partially withdrawn position relative to said assembly.

the legs comprising insulated conductors connected to respective sets of spaced electrodes carried by the legs, said spring legs having predetermined shape and position to spring relatively apart to cause the electrodes to engage with wall tissue within a cavity of the heart, in the manner

that a three dimensional array of spaced electrode contact points can be simultaneously made with the wall of the beating heart.

the sets of electrodes on respective spring legs comprising distinctive geometrical patterns, over the ventricle-contacting span of the legs, such that the active sets of electrodes provide recognizable patterns when within a ventricle of the heart and viewed with a fluoroscope, the respective locations of at least some of the electrodes of these patterns being staggered relative to electrodes on other legs in the manner to reduce lateral clumping, thus to permit the numerous electrodes to be housed in a catheter sized to be conveniently introduced into the heart.

4,522,213

MONITORING DEVICE FOR MEDICAL APPARATUS

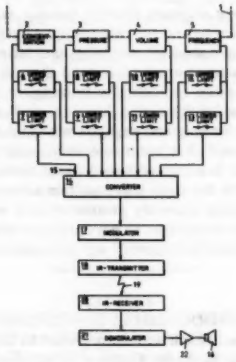
Carl F. Wallroth, Lubeck, and Rainer Bäuerle, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 568,112

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302321

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—716 **5 Claims**



1. In a monitoring device for a respirator which is capable of generating a plurality of parameter level signals corresponding to physiological quantities for a patient, said physiological quantities including the concentration of oxygen in respiratory gas for the patient, a concentration of anesthesia for respiratory gas of the patient, the pressure of respiratory gas for the patient, the volume of respiratory gas for the patient and the frequency of respiration for the patient, the circuitry comprising:

separate low limit value transmitter means for receiving each parameter level signal and for generating a low level signal when the parameter level signal is below a selected limit value for the parameter level signal;

separate high limit value transmitter means for receiving each parameter level signal and for generating a high limit signal when the parameter level signal is above a selected limit value for the parameter level signal;

signal converter means for converting each low and high limit signal into a separate intelligible language level signal indicating the type of physiological quantity which corresponds to the parameter level, and the fact that the parameter level is outside its selected limit value;

modulator means connected to said signal converter means for converting each intelligible language signal into a modulated signal;

wireless transmitter means connected to said modulator means for transmitting each modulated signal across a distance;

a plurality of wireless receiver means each for receiving at least one modulated signal from said wireless transmitter means over said distance and each adapted to be worn by a medical person attending for the patient;

demodulator means connected to each receiver means for demodulating said modulated signal into said intelligible language signal;

amplifier means connected to each demodulator means for amplifying said intelligible language signal; and

earphone means connected to each amplifier means for producing audible intelligible language and adapted to be worn by the medical person.

4,522,214

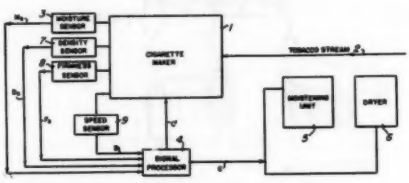
METHOD AND APPARATUS FOR CONTROLLING A CIGARETTE MAKER TO PRODUCE A CIGARETTE ROD WITH PREDETERMINED MOISTURE CONTENT

Jerome S. Osmalov, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 111,521, Jan. 14, 1980, abandoned. This application Jan. 27, 1982, Ser. No. 343,021

Int. Cl.³ A24C *5/14, 5/39*

U.S. Cl. 131—79 **31 Claims**



1. Apparatus for making a cigarette rod, said apparatus comprising:

a cigarette maker for making a cigarette rod;

control means for controlling the moisture content of tobacco being input to said cigarette maker, in a manner effective to cause the cigarette rod to have a predetermined moisture content; and

sensor means for generating a moisture sensor signal representative of the moisture content of the cigarette rod; said control means being for controlling the moisture content of the input tobacco responsive to said moisture sensor signal.

4,522,215

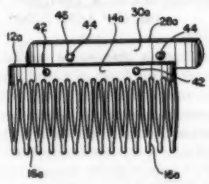
HAIR COMB WITH DETACHABLE ORNAMENT

Henry A. Verducci, 52 Zella St., Providence, R.I. 02908

Filed Jan. 14, 1980, Ser. No. 112,076

Int. Cl.³ A45D *24/00*

U.S. Cl. 132—11 R **4 Claims**



1. A hair comb device, comprising a longitudinally extending comb back, a plurality of spaced resilient teeth joined at an end thereof to said back in an aligned row, the other ends of

said aligned teeth being free for insertion into the hair of the user, a pocket between each pair of adjacent teeth adjacent to the junction of the teeth with said comb back, a longitudinally extending ornament removably mounted in overlying relation on said comb back and including at least a pair of pins extending rearwardly therefrom, said pins being slidably receivable between adjacent teeth for movement into snap-seating engagement in the pockets located between said adjacent teeth for removably mounting said ornament on said comb back in overlying and ornamental relation.

4,522,216

DENTAL FLOSS APPLICATOR

Robert L. Bunker, 429 Crowsmill Rd., Fords, N.J. 08863

Filed Aug. 29, 1980, Ser. No. 182,447
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—92 R **4 Claims**

1. A dental floss applicator for holding a section of dental floss exposed in taut engagement for dental use comprising:

a handle section;

an arm member integrally united to one end of the handle section, said arm member fitted at its free end with two spaced apart finger members forming a yoke, said fingers spaced at least 12.77 mm apart;

a single strand of dental floss in an x-shaped configuration;

means for holding and positioning (a) said single strand of floss in an x-shaped configuration the intersection of said x-shaped configuration being equi-distant from said spaced apart fingers; and

means for securing said floss in taut condition between said fingers (.) said x-shaped configuration permitting simultaneous cleaning of three sides of a given tooth through shifting of the intersection of said x-shaped configuration while engaging said applicator in reciprocal motion about a given tooth.

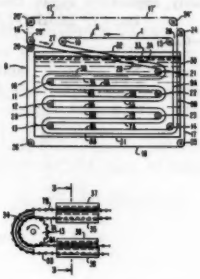
4,522,217

PAIRED CONVEYOR BELTS WITH ZIGZAG TRAVEL

Joseph C. D'Alterio, 64 Sugar Maple La., Glen Cove, N.Y. 11542

Filed Sep. 28, 1983, Ser. No. 536,704
Int. Cl.³ A23P *1/00*
U.S. Cl. 134—75 **19 Claims**

1. A conveyor with a zigzag travel path with at least one U-turn which comprises a pair of flexible continuous conveyor belts, each said belt having openings along both of its marginal portions, a set of driven belt sprockets for each said belt meshing therewith through said openings, part of the lengths of said belts moving in the same direction with their marginal portions supported by straight guides leading to and away from each said U-turn in said zigzag path to maintain said belts with a substantially uniform spacing therebetween, a pair of said sprockets positioned at each said U-turn to mesh with said openings of one of said belts, a pair of arcked guides fixed at each said U-turn so that the marginal portions of the other of said belts have sliding support around said arced guides to maintain said substantially uniform spacing between said belts around each said U-turn, and the remaining part of the lengths of said belts being maintained apart from one another to pro-



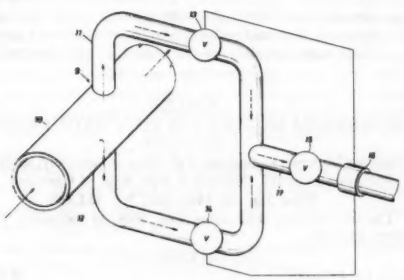
vide a place for feeding material to said conveyor near where said belts begin to move with said substantially uniform spacing therebetween and a place for discharging said material from said conveyor after said belts begin to move apart.

4,522,218

METHOD AND APPARATUS FOR SPLITTING TWO-PHASE FLOW AT PIPE TEES

A. Riza Konak, Calgary, Canada, assignor to Exxon Production Research Co., Houston, Tex.

Filed Sep. 29, 1983, Ser. No. 536,939
Int. Cl.³ F17D *3/00*; G05D *11/02*
U.S. Cl. 137—3 **5 Claims**



1. A process for diverting a stream of a flowing fluid having at least one gas phase and at least one liquid phase from a pipeline into a branch line, which comprises:

(a) withdrawing a first portion of said fluid from said pipeline in a generally upward and radially outward direction, and at a first flow rate;

(b) simultaneously withdrawing a second portion of said fluid from said pipeline in a generally downward and radially outward direction, and at a second flow rate;

(c) combining said first and second portions into said branch line; and

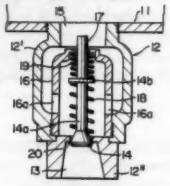
(d) regulating said first and second flow rates so that said first and second portions combine to form a stream of fluid in said branch line at a predetermined, desired quality.

4,522,219

FREEZE PREVENTING VALVE

Ichizo Ohkata, Yokohama, Japan, assignor to Kato Hatsujo Kaisha Ltd., Yokohama, Japan

Filed Apr. 25, 1984, Ser. No. 603,768
Claims priority, application Japan, Dec. 31, 1983, 58-251434
Int. Cl.³ E03B 7/12
U.S. Cl. 137—62 **2 Claims**



1. A freeze preventing valve comprising:

a valve body longitudinally provided with an inserting hole at the upper part thereof in a hollow valve housing connected to a steam feed pipe,

a valve element having a shaft disposed movably through the inserting hole of said valve body to be able to open an exhaust port opened at the lower end of the housing, to be vertically guided through the inserting hole of the housing and having a collar secured at an intermediate position on said shaft,

a spring of shape memory alloy interposed between the upper surface of a valve seat of the valve housing and the lower surface of the collar for urging the valve element to close said valve by moving the valve element upwardly,

a bias spring mounted between the lower surface of the upper part of the valve body and the upper surface of the collar for urging said valve element to open said valve,

said valve body being formed with a plurality of holes to be closed to the exhaust port by said valve element when steam is introduced from said pipe, through the housing, into said valve body, to heat and expand said spring of shape memory alloy and to be opened to the exhaust port by upward movement of said valve element when condensed water from the pipe is introduced, through the housing, into said valve body to contract said spring of shape memory alloy by the tension of said bias spring.

4,522,220

DIAPHRAGM MODULE FOR PNEUMATIC CONTROL SYSTEMS

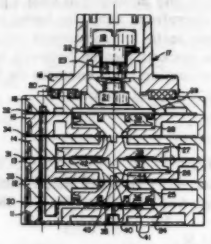
Vladimir Multrus, Limeshain, Fed. Rep. of Germany, assignor to Honeywell GmbH, Offenbach, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,588
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204100
Int. Cl.³ G05D 16/00
U.S. Cl. 137—85 **3 Claims**

1. A diaphragm module for pneumatic control systems comprising at least a pressure comparing stage for converting an applied pressure difference into a force and a force/pressure transducer being controlled by the pressure comparing stage wherein, in a multiple-part housing, chambers are formed by comparing and tightening diaphragms with pressures to be compared with each other being applied to said chambers and wherein by means of diaphragms disks loosely piled up in the housing and being admitted by the comparing diaphragms the resulting force is accordingly converted into a displacement of the diaphragm disks, characterized by the following features:

a. said diaphragm disks comprise central pin projections and recesses, wherein said pin projections of a diaphragm disk is inserted into a recess of an adjacent diaphragm disk via a central hole provided in a corresponding one of said diaphragms, respectively;

b. said housing and the diaphragm disks comprise annular ribs which are pressed into corresponding diaphragms for tightening when pressure is applied; and,



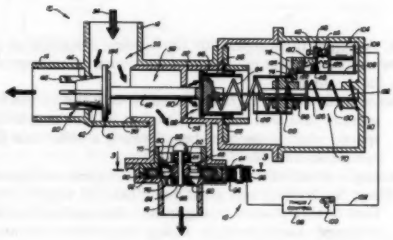
c. at least two diaphragm disks comprise in their planar surfaces concentric annular grooves which are engaged by annular collars of related diaphragms.

4,522,221

TIMED FLOW CONTROL VALVE ASSEMBLY

Donald R. Chivens, Northridge; Paul Greskovics, Manhattan Beach, and Edward C. Kelm, Pasadena, all of Calif., assignors to Autarkic Flow Controls, Los Angeles, Calif.

Filed Aug. 15, 1983, Ser. No. 523,711
Int. Cl.³ E04H 3/20
U.S. Cl. 137—118 **50 Claims**



50. A swimming pool filtration and cleaning system, comprising, in combination:

a circulation pump for pumping pool water through a filter unit prior to return to the swimming pool;

a water-powered in-the-pool cleaning device; and

a flow control valve assembly for controlling and regulating water flow through a return conduit to the pool and to the cleaning device, said flow control valve assembly including:

a valve inlet for receiving water under pressure from the pool filtration and cleaning system;

a primary outlet coupled to the return conduit;

a secondary outlet coupled to the in-the-pool cleaning device;

a regulator valve;

means for positioning said regulator valve in a first operative state permitting water flow through both said primary and secondary outlets and modulating water flow through said primary outlet to maintain water pressure at said secondry outlet at a predetermined and substantially constant pressure level for a predetermined time interval; and

means for positioning said regulator valve in a second operative state at the conclusion of said predetermined time interval closing said secondary outlet to water

flow and permitting substantially unobstructed water flow through said primary outlet.

4,522,222

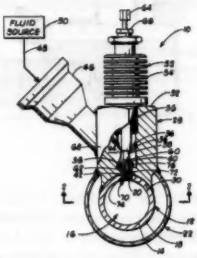
NON-PLUGGING INJECTION VALVE

Henry S. Carey, Jr., Wilsonville, Ala., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 22, 1982, Ser. No. 421,534

Int. Cl.³ B08B *3/04, 9/00*

U.S. Cl. 137—240 **10 Claims**



1. In a process for deashing coal by the treatment of pulverized coal with a solvent fluid at elevated temperature and pressure wherein the solvent-coal mixture is permitted to separate into two phases in a separation zone with the heavier phase gravitating to the lower end of the vessel defining the separation zone, in a valve apparatus for the process, the improvement comprising:

an annular pipe conduit having a flow passage extending therethrough, an outer peripheral surface, and an injection aperture formed through the conduit and intersecting the flow passage, the injection aperture being adapted for receiving fluid to be injected into the flow passage, one end of the conduit being connected to the vessel defining the separation zone for receiving the heavier phase and passing the heavier phase through the flow passage;

a valve body having a valve chamber formed in a portion of the valve body, a bore extending through a portion of the valve body intersecting the valve chamber and intersecting a portion of the valve body, an exit port extending through a portion of the valve body intersecting the valve chamber and intersecting a portion of the valve body, the bore being adapted for receiving the fluid and passing the fluid into the valve chamber, the valve body being mounted on an outer surface of the pipe conduit and the exit port being aligned with the injection port in the conduit a plug means being connected to the valve body through the exit port, a portion of the plug means being connected to the valve body within the exit port and another portion of the plug means being connected to the pipe conduit within the injection aperture when a frusto-conical surface on the plug means engages a frusto-conical surface on the interior of the valve body; and

a valve closure member having a punch portion and being supported in the valve body, the valve closure member being moveable to a valve closure position when the valve closure member engages the plug means for interrupting fluidic communication between the valve chamber and the exit port and moveable to an open position establishing fluidic communication between the valve chamber and the exit port, the punch portion of the valve closure member extending through the portion of the plug means that is connected to the valve body within the exit port and another portion of the punch portion extending through the portion of the plug means that is connected to the pipe conduit through at least a portion of the injection aperture in the valve closure position of the valve closure member, the solvent fluid being passable through the bore, into the valve chamber, through the exit port and into the flow passage in the conduit in the open position of the valve closure member to prevent deposits from forming about the valve closure member.

4,522,223

DOUBLE POPPET VALVE

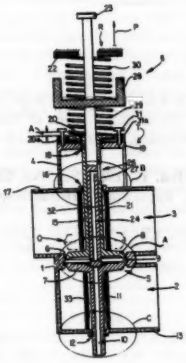
Manfred Balsys; Dieter Kling, both of Biberach; Hans Maier, Laupheim; Franz Miller, Biberach, and Walter Schmid, Ummendorf, all of Fed. Rep. of Germany, assignors to Albert Handtmann Armaturenfabrik GmbH & Co., KG., Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,390

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224852

Int. Cl.³ F16K *11/20;* **B08B** *9/02*

U.S. Cl. 137—240 **9 Claims**



1. A double-seat valve comprising an advancing valve head movable axially between a closed position and an open position, a coaxial follower valve head having a closed position intermediate said open and closed positions of the advancing valve head and having an open position in which it is engaged with the advancing valve head, and a valve housing providing for communication between a pair of ducts when said valve heads are in their open positions and defining a seat for each said valve head which the valve head sealingly engages when it its closed position, said valve housing being cooperable with the valve heads in their closed positions to define a leakage chamber between them which is substantially sealed from each of said ducts by one of said valve heads and which is drained to a leakage outlet remote from said ducts, said double-seat valve being characterized by:

A. said follower valve head having a diameter at least as large as that of said advancing valve head;

B. each of said valve heads having radially outwardly facing sealing means around its periphery;

C. said valve housing having therein a passage for communicating said ducts which has a pair of cylindrical surface portions, one for each of said valve heads, each said cylindrical surface portion

(1) having a diameter for slidable sealing engagement by its valve head and

(2) extending a substantial distance axially along said passage, with one end adjacent to the other cylindrical surface portion and an oppposite end remote therefrom, said seat for each valve head comprising a zone of its cylindrical surface portion that is intermediate said ends thereof;

D. an actuating rod to which one of said valve heads has a coaxial connection, said actuating rod having a feed bore therein,

(1) one end of which is communicated with a cleaning fluid inlet that is axially spaced from both of said valve heads and

(2) the other end of which is communicated with a plurality of nozzle bores that are between the valve heads and open radially outwardly for discharge towards said cylindrical surface portions; and

E. actuating means for moving each of said valve heads independently of the other axially within its said cylindrical surface portion between its seat and a defined position in which the valve head is spaced from its seat and is at the axial side thereof that is remote from the other valve head but maintains sealing engagement with its cylindrical surface, to provide for cleaning the valve seats without contamination of said ducts.

4,522,224

GATE VALVE CONSTRUCTION

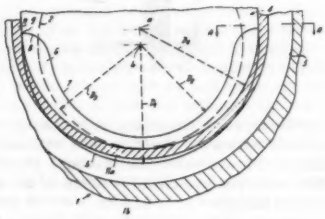
Hans Stalder, and Hans Sidler, both of Eschenbach, Switzerland, assignors to Sistag, Maschinenfabrik Sidler Stalder AG, Switzerland

Filed Jun. 19, 1984, Ser. No. 622,219

Claims priority, application Switzerland, Jun. 24, 1983, 3455/83

Int. Cl.³ F16K *3/30, 25/00*

U.S. Cl. 137—242 **2 Claims**



1. A gate valve comprising:

a casing (1) having a throat passage (2) with a guide groove (3) therein, said casing having a guide strip (11) covering a front portion of said guide groove;

a seal strip (12) in said guide groove; and

a valve plate (4) movable perpendicularly to said throat passage in said guide groove and against said seal strip, said plate having a front surface with a curved front lower edge (7), a rear surface with a curved rear lower edge (5*a*), opposite planar narrow sides each having parallel front edges (4*b*) and rear edges (4*a*), said rear edges connected to said rear lower edge, a lower rim (5) defined between said rear lower edge (5*a*) and a curved lower inner edge (5*b*), and a curved concave recess (6) defined between said front lower edge (7) and said inner edge (5*b*), said front lower edge (7) having concavely curved shear arches (8) extending outwardly into contact with a lower end of said front parallel edges (4*b*) at an intersection (9), said inner edge (5*b*) having concavely curved shear arches (10) curving upwardly into contact with said intersections (9), said front lower edge (7) having a smaller diameter than said inner edge (5*b*), and at least a portion of said seal strip (12) being deformed into said concave recess (6) when said lower rim (5) engages said seal strip (12) to provide an effective seal between said valve plate (4) and the casing (1).

4,522,225

COCK FOR THE HEATING CIRCUITS OF A VEHICLE

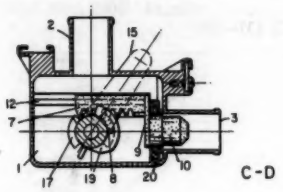
Joaquin R. Llauge, and Alberto P. Isanta, both of Barcelona, Spain, assignors to ITW Espana S.A., Barcelona, Spain

Filed Nov. 18, 1982, Ser. No. 442,829

Claims priority, application Spain, Nov. 19, 1981, 261579

Int. Cl.³ B60P *3/30*

U.S. Cl. 137—351 **4 Claims**



1. A liquid valve for the liquid heating circuits of a vehicle, including a sealed case having means communicating between its interior and exterior including a liquid inlet and a liquid outlet, means for mounting the valve on said vehicle, a mechanism for opening and closing at least one of said inlet and said outlet, said case including a planar wall of substantial extent carrying guide means generally parallel to one of said communicating means, a member having a rack thereon movable along said guide means and carrying a valve plug capable of closing off a seat in said one communicating means, a rotatable means carried adjacent said planar wall and having a toothed segment engageable with and actuating said rack along said guide means thereby moving said valve plug into and out of engagement with said seat, sealed means communicating through said case and cooperating with external actuating means to rotate said rotatable means to thereby open and close said valve by movement of said rack linearly within said case, said rotatable means having a generally cylindrical element including said toothed segment with a coaxial cylindrical appendage extending from one end and journaled in a mating recess in said planar wall, a rotatable shaft at one end and nonrotatably connected to said element while serving as said sealed means and emerging from the casing to receive at its opposite faceted end said external actuating means in the form of a lever connected at one end to said shaft and at the opposite end to an activating means such as a cable, said opposite end of said shaft being furthermore recessed to receive an o-ring seal.

4,522,226

VALVE FOR AUTOMATIC STOPPAGE OF WATER SUPPLY

Tamio Yamagiwa, Tokyo, Japan, assignor to Hi-Sonic Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,528

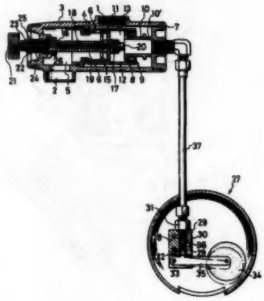
Claims priority, application Japan, Oct. 21, 1983, 58-163085[U]; Oct. 21, 1983, 58-163086[U]

Int. Cl.³ F16K *21/18, 31/143*

U.S. Cl. 137—390 **2 Claims**

1. A valve for automatic stoppage of water supply comprising: a valve body having an inlet port adapted to be connected to a faucet and an outlet, said body having its open and closed ends; a hollow valve seat member fixed at its one end to the interior of said valve body so as to form a chamber communicating with said outlet port and having a plurality of openings formed therein; a cap secured to the open end of said body and having an inner hollow element with a sealing portion; a hollow valve member extending between and slidably engaging said hollow valve seat member and said sealing portion of said cap, said hollow valve member being provided at its central portion with a transverse partition wall; a pressure chamber formed between said transverse partition wall and said hollow element of said cap within said hollow valve member; a valve

rod extending through the end closure of said valve body into said chamber and fixed at its inner end to said transverse partition wall, said valve rod having an axial bore and a plurality of radial apertures formed in the wall defining said bore, said chamber and said pressure chamber being communicated with each other through said axial and radial apertures; a valve actuating rod extending through said valve rod and provided at its inner end with a valve member adapted to open and close the open end of said axial bore in said valve rod, said valve actuating rod being provided on the outer end thereof with a knob spaced from the exposed end of said valve rod; a spring adapted to bias said valve member so as to close the open end



of said axial bore; a float-type stop valve attached to a bath tub so as to operate at a desired water level; a connecting pipe through which said pressure chamber is connected to said float-type stop valve to allow pressurization and depressurization of said pressure chamber; a small aperture formed in said hollow element to provide a communication between said inlet port and said pressure chamber to pressurize said pressure chamber to maintain the hollow valve member closed and said valve actuating rod being operable independently to actuate said valve actuating rod valve member to allow the water supply to the bath tub even when said float-type stop valve closes said connecting pipe when the desired water level has been reached.

4,522,227

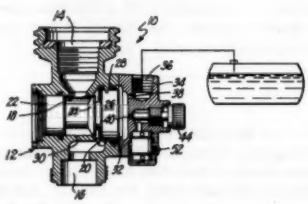
FILL VALVE RESPONSIVE TO LIQUID LEVEL

Gerald D. Mylander, 22486 Alcudia, Mission Viejo, Calif. 92692

Filed May 10, 1983, Ser. No. 493,259

Int. Cl.³ F16K *21/18*

U.S. Cl. 137—393 **15 Claims**



1. A fill valve responsive to liquid level, said fill valve being connectable into a system between a supply and a tank to control the filling of the tank, said fill valve having a body and a passage through said body through which a compressible fluid passes to fill the tank, a valve in said body to close the passage through said body to cut off filling of the tank;

a control chamber within said body and pressure-responsive means adjacent said control chamber and connected to said valve for closing said valve upon adequate increase in pressure in said control chamber;

at least first and subsequent serially connected orifices, with said control chamber connected between said first and subsequent orifices, said first orifice being connectable to a liquid level-sensing tube in a tank and said subsequent orifice being for discharge to atmosphere so that the pressure in said control chamber is a function of the pressure and liquid or vapor state of the compressible fluid flowing through the first orifice; and

a pressure booster in association with said subsequent orifice, said pressure booster comprising a cylinder having a head end and a piston within said cylinder defining a head end space for receiving the compressible fluid, a valve spool on said piston away from said head end of said cylinder, a land being disposed at a lower end on said valve spool, said land coacting with said subsequent orifice to decrease the open area of said subsequent orifice when said pressure booster piston moves toward the head end of its cylinder, a restricted fluid passage between said booster piston and said cylinder and between the land side and cylinder head side of said booster piston, said booster piston being without the necessity of spring bias because of the compressibility of the fluid within the head end space so that its position is controlled by the pressure within the head end space and the pressure on the valve spool so that when pressure rises rapidly in said control chamber, said pressure booster piston moves without the need for any dampening effect and automatically increases restriction in said subsequent orifice to further automatically raise the pressure in said control chamber to reliably shift said valve spool and automatically reopens thereafter without requiring change in the control chamber pressure.

4,522,228

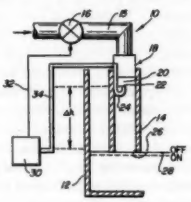
FLUIDIC LEVEL CONTROL SYSTEM

Daniel N. Campau, 656 Duxbury Ct., Grand Rapids, Mich. 49506

Filed Jun. 12, 1984, Ser. No. 620,071

Int. Cl.³ F15C *1/14*; F16K *21/18*

U.S. Cl. 137—393 **20 Claims**



1. A liquid level control system for controlling the flow of liquid into a reservoir, storage tank or other container, comprising:

nozzle means for developing a liquid flow stream therethrough, valve means in said liquid flow stream for opening and closing the nozzle;

fluid amplifier means associated with said nozzle and including a fluid power stream, signal developing means for receiving a fluid pressure signal from said fluid power stream, and sensing means for diverting said fluid power stream from said signal developing means in response to the static presence of the interface at a predetermined sensing level of liquid in said reservoir;

pressure responsive switch means coupled to said valve means and located at a level below the signal developing means of said fluid amplifier means and at a depth equal to a hydrostatic pressure head sufficient to operate the switch means; and

conduit means communicating between said signal developing means and said pressure responsive switch means to

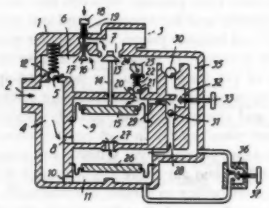
create said hydrostatic pressure head within the conduit means corresponding to a height of approximately the distance between the switch means and the signal developing means above the switch means to maintain the switch means and, therefore, the valve means in a first condition when said fluid power stream delivers a fluid pressure signal to said signal developing means and a second condition when the fluid power stream is diverted from the signal developing means.

4,522,229

SAFETY DEVICE FOR WATER-PIPES

Guido Van de Moortele, Antwerp, Belgium, assignor to Standard Société Anonyme, Luxemburg, Luxembourg

Filed Aug. 3, 1984, Ser. No. 638,102
Claims priority, application Belgium, Aug. 10, 1983, 2/60179
Int. Cl.³ F16K *17/00*
U.S. Cl. 137—460 **5 Claims**



1. Safety device for water-pipes, comprising a housing with an inlet connected to a water supply pipe and with an outlet connected to a water discharge pipe, in said housing a supply chamber connected to a discharge chamber leading into said outlet, said supply chamber being also connected to a measuring chamber and a precontrol chamber, a valve provided between said supply and discharge chambers, a shut-off valve provided between said discharge chamber and said outlet, said shut-off valve forming part of a diaphragm provided in said measuring chamber, a push-down reset valve provided in said discharge chamber to apply pressure to said outlet and to open said shut-off valve, a push-button for pressing down said reset valve, and adjustable valve provided between said discharge chamber and the upper part of said measuring chamber for setting the desired water consumption, a precontrol diaphragm provided in said precontrol chamber for closing off an opening provided between this chamber and said measuring chamber, a channel provided between said discharge chamber and said precontrol chamber, a second channel provided between said discharge chamber and said precontrol chamber, an opening provided between said measuring chamber and first mentioned channel, a valve for closing first mentioned channel between said precontrol chamber and last mentioned opening of said measuring chamber, a regulating means for regulating the flow rate between said measuring chamber and said discharge chamber and for adjusting the shut-off speed of said shut-off valve, and a flow regulator provided between the upper part of said precontrol chamber and said discharge chamber for adjusting the flow in the by-pass connection of the device.

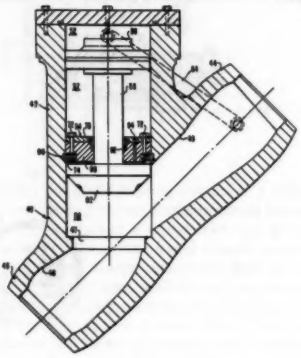
4,522,230

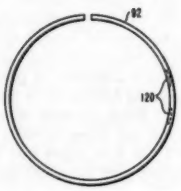
ORIFICE PLATE SEAL RING FOR CONTROLLED CLOSURE CHECK VALVE

Robert L. Clapper, Cary, N.C.; Richard J. Gradle, and Earl A. Bake, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1983, Ser. No. 468,832
Int. Cl.³ F16K *31/38*
U.S. Cl. 137—496 **9 Claims**

1. A check valve comprised of a body having inlet and outlet passages and a control chamber within said body, an orifice plate dividing said chamber into dashpot chamber and a valve chamber which is in communication with said inlet and outlet passages, a valve seat in said valve chamber separating said inlet and said outlet passages, a valve closure element mounted for reciprocation in said valve chamber between a valve open position an a valve closed position where said element is seated upon said seat, a piston mounted for reciprocation in said dashpot chamber, a piston rod extending through an opening in said orifice plate connecting said closure element and said piston, means to apply the pressure in said outlet passage to the





piston to urge the piston and closure element toward valve closed position when the pressure in said outlet passage exceeds the pressure in said inlet passage, passage means through said orifice plate to allow the flow of fluid from said dashpot chamber to said valve chamber at a first rate of flow, sealing means responsive to the pressure differential between said dashpot chamber and said valve chamber to close a portion of said passage means and reduce the rate of flow from said dashpot chamber to a second rate of flow when said pressure in said dashpot chamber exceeds the pressure in said valve chamber by a predetermined amount.

4,522,231

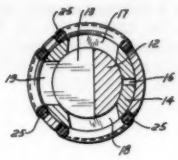
SANITARY WATER VALVE

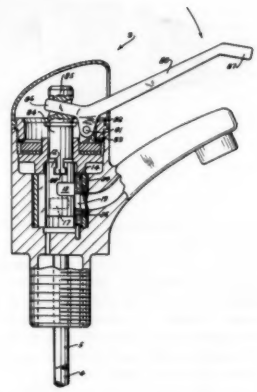
Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 509,126, Jun. 30, 1983, abandoned. This application Jun. 22, 1984, Ser. No. 623,641
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224991
Int. Cl.³ F16K *11/02, 19/00*
U.S. Cl. 137—625.17 **31 Claims**

1. A sanitary water valve comprising a stationary cylinder having at least one water inlet orifice, a rotatable and longitudinally shiftable piston positioned in said cylinder to control the flow of water through said at least one water inlet orifice from a closed to an opened position; said cylinder having a longitu-

dinal extending continuous lengthwise slot and said piston and cylinder having mating surfaces, which form a watertight,





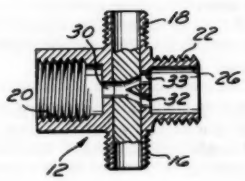
mechanical seal between their mating surfaces without the necessity of using static seal means.

4,522,232

SHOWER FLOW CONTROLLER

Kenneth F. Ferguson, 16467 Seneca, Victorville, Calif. 92392

Filed Apr. 30, 1982, Ser. No. 373,300
Int. Cl.³ F16K *5/04, 5/10;* **B05B** *1/30*
U.S. Cl. 137—625.32 **9 Claims**



1. A flow controller for interconnecting a shower pipe to a shower head or the like, comprising:

an input end structure having an internally threaded inlet for connection to said shower pipe, said inlet including an inlet aperture;

an output end structure having an externally threaded outlet for connection to said shower head, said outlet forming an outlet cavity having an axis in the direction of said flow and an inner cavity side wall;

means for controlling the flow of water, said means disposed between said input end structure and said output end structure, said means containing a Y-shaped passage therethrough, said passage comprising:

(a) an inlet portion forming the leg of said Y-shaped passage, said inlet portion for receiving the flow of water from said inlet aperture; and

(b) two outlet portions forming the arms of said Y-shaped passage, said outlet portions having walls for directing said flow of water, said walls terminating at a location spaced from said cavity side wall toward said axis, said walls aligned to direct the entire flow of water directly at said inner cavity side wall to atomize said water inside said output end structure, said cavity side wall defining an outlet end of considerably larger cross section than the greatest distance between said walls of said controller outlet portions; and

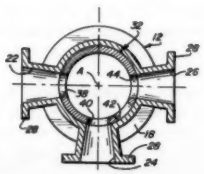
said controlling means comprising a controlling shaft rotatably movable with respect to said input end structure and said output end structure to selectively vary the flow of water through said Y-shaped passage by varying the alignment between said inlet portion and said inlet aperture.

4,522,233

MULTI-POSITION PLUG VALVE

Yousef Mojadad, Lenexa, Kans., assignor to Smith & Loveless, Inc., Lenexa, Kans.

Filed Sep. 29, 1982, Ser. No. 427,635
Int. Cl.³ F16K *11/083*
U.S. Cl. 137—625.47 **14 Claims**



1. A multi-position valve, comprising:

a valve body defining an interior bore and first, second, and third valve ports communicating with the interior bore, said valve body further defining a main port communicating with the interior bore of the valve body; and

plug means adapted to fit within said interior bore of said valve body for rotation with respect thereto, said plug means being selectively positionable within said valve body and including means for providing fluid communication, via the interior of said plug means, between said main port and: (1) any selected individual one of said first, second, and third valve ports; (2) said first and second valve ports only; (3) said first and third valve ports only; (4) said second and third valve ports only; and (5) all of said first, second, and third valve ports, said plug means being further positionable to isolate all of said valve ports from said main port.

4,522,234

MULTIPLE CONDUIT DRILL PIPE

Jackson M. Kellner, Midland, and William R. Garrett, Houston, both of Tex., assignors to Smith International Inc., Newport Beach, Calif.

Continuation of Ser. No. 100,757, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 859,049, Dec. 9, 1977, abandoned, which is a continuation of Ser. No. 718,370, Aug. 27, 1976, abandoned, which is a division of Ser. No. 643,254, Dec. 22, 1975, Pat. No. 4,040,495. This application Dec. 21, 1981, Ser. No. 333,136
Int. Cl.³ F16L *39/00;* **E21B** *1/06*
U.S. Cl. 138—108 **17 Claims**

1. Multiple conduit pipe comprising

a first member including connector means at each end for making connection with correlative connector means on

the like members of like pipe to be connected to the ends of said first member,

first fluid passage means providing for fluid passage through said first member from one end of the first member to the other all the way through the first said connector means to place said first fluid passage means in fluid flow communication with the like fluid passage means through like members of like pipes when connected to the ends of said first member,

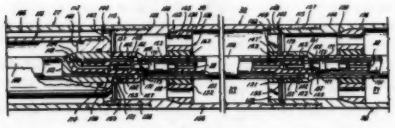
said first member and said first fluid passage means comprising a first tube with tubular telescopic pin and box connector means at the ends thereof,

a second member including further connector means at each end for making connection with correlative connector means on the like members of like pipe to be connected to the ends of said second member,

said second member and said further connector means comprising a second tube with tubular, shouldered, threaded, pin and box screw means at the ends thereof,

said second tube and screw connector means being disposed concentrically about said first tube and telescopic connector means respectively,

outer diameters of said first tube and the first said connector means being smaller than the inner diameters of said second tube and said further connector means respectively, with second fluid passage means formed therebetween extending from one end of the pipe to the other to place said second fluid passage means in fluid flow communication with like fluid passage means through like pipes when said further connector means at each end of said second member are connected to correlative connector means of such like pipes,



said telescopic connector means being free of rigid shoulders that will abut rigid shoulders on correlative telescopic connector means of like pipes when said shouldered screw connector means are made up fully with correlative screw connector means of like pipe,

first positioning means extending between the first and second members rigidly connecting one end of the first member to the adjacent one end of said second member, and

second positioning means extending between the first and second members elastomerically restraining the other end of the first member relative to the adjacent other end of said second member,

both of said members being integral between said first and second positioning means, whereby because of said first positioning means rigidly connecting said first and second members, said first member cannot rotate without limit nor move axially without limit relative to said second member at said second positioning means, but said second positioning means, being elastomeric, allowing for a certain amount of relative rotation, turning, and twisting between said members thereat,

said second positioning means independent of said first positioning means allowing only a limited amount of axial movement of said other end of the first member away from said one end of the second member.

4,522,235

HOSE STRUCTURE

Karl K. Kluss, Concord, N.C.; Terry F. Allen, Barberton, and John M. Sawyer, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 320,990, Nov. 13, 1981, abandoned, which is a continuation of Ser. No. 111,070, Jan. 10, 1980, abandoned. This application May 4, 1983, Ser. No. 491,495

Int. Cl.³ F16L *11/08*

U.S. Cl. 138—130 **11 Claims**

1. A suction and discharge hose having a central longitudinal axis and comprising:

(i) an inner tube of elastomer material;

(ii) a cover layer of elastomeric material spaced radially outwardly of said inner tube and forming an outer surface for the hose;

(iii) at least one reinforcing layer of elastomer having embedded therein reinforcing cords extending in opposite hand helical patterns about the hose axis;

(iv) at least one filler layer disposed intermediate said inner tube and said cover layer and being separate and distinct from said inner tube and from said cover layer and from said at least one reinforcing layer, said filler layer being of elastomeric material having a tensile modulus at 50 percent elongation of about 400 to about 800 pounds per square inch and a hardness from about 70 to about 85 Shore A, said filler layer elastomeric material having a total thickness from about one fifteenth to about one fifth of the mean radius of the filler layer elastomeric material from the hose axis;

(v) from about 10 to about 18 percent by weight discontinuous elongated fibers embedded in randomly distributed manner in substantially parallel relation in said filler layer, said fibers being oriented so as to extend generally in a helical pattern about the hose axis at an angle of at least 45° relative to the hose axis so as to reinforce the hose against collapse.

4,522,236
ELECTRICAL SYSTEM FOR MONITORING WARP YARNS IN WEAVING MACHINES

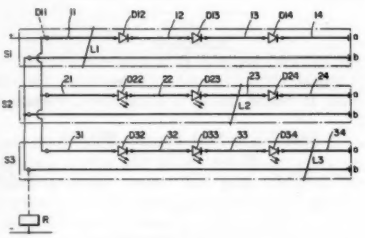
Heinz P. Löhr, Hergatz, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Mar. 15, 1983, Ser. No. 475,495

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210333

Int. Cl.³ D03D 51/28

U.S. Cl. 139—353 6 Claims



1. In a system for electrically monitoring warp yarns in a weaving machine, wherein electrically conducting monitoring rail means include at least one continuous first rail member and at least one sectioned second rail member, insulating means electrically insulating said first and second rail members from each other, said second sectioned rail member including a plurality of rail sections also electrically insulated from each other but arranged in a row extending substantially in parallel to said continuous first rail member, and drop wire means operatively arranged for electrically connecting said continuous first rail member to any one of said rail sections of said second rail member in response to any warp yarn rupture, the improvement comprising an electrical monitoring circuit including individual indicator means electrically connected in series with adjacent rail sections (11, 12, . . .) for forming an electrical series circuit of rail sections alternating with said individual indicator means, a source of electrical power, conductor means electrically connecting said first continuous rail member to one terminal of said electrical power source, and further conductor means electrically connecting said series circuit to another terminal of said electrical power source, whereby at least one of said individual indicator means is energized by said electrical power source in said electrical monitoring circuit when said drop wire means drop to thereby pinpoint a location where a warp yarn rupture occurred.

4,522,237
APPARATUS FOR DISPENSING LIQUIDS

Keizo Endo, Yokohama; Hiroshi Matsumura, Kamakura; Yoshifumi Hasunuma, Yokohama; Siro Masai, and Noboru Oguma, both of Kanagawa, all of Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

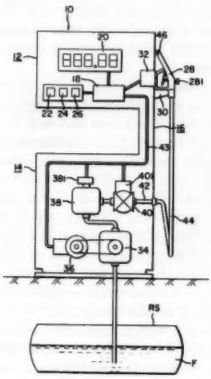
Filed Jul. 8, 1982, Ser. No. 396,199

Claims priority, application Japan, Aug. 20, 1981, 56-129326; Aug. 20, 1981, 56-129327; Aug. 20, 1981, 56-129328; Aug. 21, 1981, 56-130237

Int. Cl.³ B67C 5/377; B65B 3/36

U.S. Cl. 141—95 17 Claims

1. Apparatus for dispersing a liquid comprising pump means for pumping said liquid, conduit means through which said liquid is pumped, flow meter means in said conduit means measuring the amount of liquid passing through said conduit means, control valve means in said conduit means for controlling the flow of said liquid through said conduit means, dispensing nozzle means connected to said conduit means for dispensing said liquid, a liquid sensor means mounted in an end portion of said nozzle means for sensing liquid in said end portion and transmitting a detecting signal when said liquid is sensed, a valve opening memory circuit storing memory of a plurality of valve opening positions for said control valve means, a valve control circuit operable upon receiving said detecting signal from said liquid sensor means to cause said valve opening memory circuit to transmit a control signal corresponding to any one of said plurality of valve opening positions, a counter circuit operable to receive a signal from said flow meter means and provide a counting signal indicative



of the amount of liquid through said flow meter means, said counter circuit also being operable to provide an integral dispensing signal, and an integral dispensation control circuit responsive to said control signal and said detecting signal along with said integral dispensing signal to transmit a dispensing ceasing signal to said valve control circuit to close said control valve means after the apparatus has dispensed an amount of liquid which is rounded off to a predetermined digit.

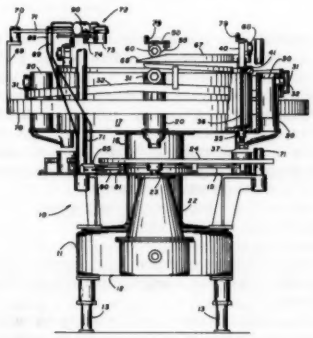
4,522,238
VALVE CONTROL MECHANISM FOR RECIPROCATING VALVES OF A POSITIVE DISPLACEMENT ROTARY FILLING MACHINE

Everett S. Minard, Sacramento, Calif., assignor to Elmar Industries, Inc., Santa Clara, Calif.

Filed Feb. 16, 1983, Ser. No. 467,182

Int. Cl.³ B65B 57/02

U.S. Cl. 141—142 4 Claims



1. In a filling machine comprising a frame having rotatably mounted on an axis thereon a reservoir,

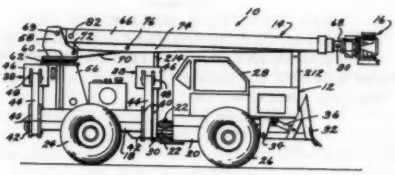
a plurality of filling stations
each including
a cylinder,
a piston reciprocable therein,
a discharge nozzle, and
a valve selectively positionable to place said cylinder into communication with either said discharge nozzle or said reservoir; and
a filling star for holding cans beneath said discharge nozzles as said filling stations are rotated on said frame; and
means comprising a feed star rotatable on a separate axis in synchronism with said filling star for supplying empty cans to said filling star the improvement comprising
a no-can-no-fill valve operating means comprising
a cam track,
a cam follower pivotally mounted on an axis on each of said valves, valve control means selectively settable to either free said cam follower for pivotal movement on said valve without displacement of said valve or to lock said cam follower against movement in relation to said valve whereby said valve will be displaced by said cam follower as it moves along said cam track, and a selectively settable trip shoe assembly carried by said frame at a position in advance of the position at which receptacles are fed to said filling star by said feed star for setting said valve control means to either of its aforesaid settings according to the setting of said trip shoe assembly, as said valves move past said assembly during rotation of said filling stations whereby said valve control means are reset to a different setting only in response to a change in the setting of said trip shoe assembly.

4,522,239

SWATH CUTTING AND GRIPPING TREE DELIMBER

Walden M. Gaitten, deceased, late of Sylacauga, Ala. (by Dorothy A. Gaitten, executrix), assignor to Southeastern Technology, Inc., Bessemer, Ala.

Filed Oct. 14, 1983, Ser. No. 542,229
Int. Cl.³ B27L 1/00
U.S. Cl. 144—2 Z **31 Claims**



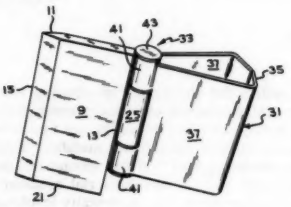
1. Apparatus for removing limbs of standing trees to maintain a power line right-of-way free of tree limb interference comprising
a self-propelled vehicle having power operated ground stabilizing means,
a telescoping boom,
means mounting one end of the boom on said vehicle for horizontal swinging movement about an upright axis and for vertical pivoting movement,
a limb cutting assembly on the opposite free end of said boom, said assembly including
a mounting structure,
means mounting said mounting structure on said boom for movements about a longitudinal axis with respect to said boom,
a power operated cutter having a convex cutting periphery,
means mounting said cutter on said mounting structure for movement between a retracted inoperable position and an extended operative position wherein said convex cutting periphery extends longitudinally outwardly from said mounting structure and is exposed both longitudinally outwardly and transversely outwardly so as to enable the same to be moved with a transverse swath cutting action by virtue of the movements of the boom, and
limb gripping means carried by said mounting structure for movement from an inoperative position disposed longitudinally inwardly of said cutter so as to permit the swath cutting action thereof and an operative position disposed longitudinally outwardly of said cutter when the latter is in its retracted position so as to grippingly engage a limb or a group of limbs and hold the same in a position to be cut in response to the movement of the cutter from its retracted position into its extended position.

4,522,240

SPLITTING WEDGE FOR LOG SPLITTER

Robert H. Green, 17518 Euler Rd., Bowling Green, Ohio 43402, and James D. Simon, 10410 S. Dixie Hwy., Portage, Ohio 43451

Filed Feb. 8, 1984, Ser. No. 578,003
Int. Cl.³ B27L 7/00
U.S. Cl. 144—193 E **13 Claims**



13. A wood splitter comprising:
two substantially parallel and adjacent tubes, said tubes defining a support base for wood that is to be split;
a thin cutting member having a first end a second end, said first end defining a sharp edge for initiating a cut in said wood to be split, said first end being disposed to first engage said wood, said cutting member extending between and being connected to said tubes, said cutting member being disposed at an angle of about 65° to about 85° with respect to said tubes, said cutting member being secured to said tubes along said neutral axis of said tubes whereby said cutting member exerts torsional forces as well as bending force on said tubes when said wood to be split is advanced against said cutting member; and,
a triangular-shaped wedge member having an apex and a base, said apex of said wedge member being pivotally connected to said second end of said cutting member and said base being spaced apart from said cutting member, said base pivoting about an axis that passes through said apex of said triangular-shaped wedge member, said base being from about 2 to about 5 times the thickness of said cutting member whereby said wedge member can pivot with respect to said cutting member as said wood is split to follow the grain in said wood to reduce the splitting force required to split said wood.

4,522,241

LOG SPLITTER

Gene P. West, Grass Valley, Calif., assignor to Gene West, Inc., Nevada City, Calif.

Filed Aug. 5, 1983, Ser. No. 520,654
Int. Cl.³ B27L 7/00
U.S. Cl. 144—193 A **6 Claims**

1. A log splitter comprising:
a frame having an upper log supporting surface and an I-beam support member, said log supporting surface hav-

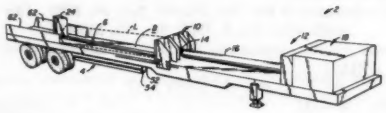
ing elongate first and second portions, said second portion having an opening extending along the length thereof;

a push block;

means for driving said push block along said first portion of said log supporting surface;

a splitting wedge extending through said opening in said second portion;

means for movably mounting said splitting wedge to said I-beam support member for movement along said second portion;



means for selectively driving said push block towards said splitting wedge and means for selectively driving said splitting wedge toward said push block, to split a log supported by said support surface between said wedge and said push block; and

a bark ramp extending from a forward edge of the splitting wedge downwardly toward the support surface and outwardly away from the splitting wedge with a distal end of said ramp being generally level with a central portion of said support surface so debris pushed by log toward said splitting wedge is diverted up and away from said splitting wedge by said bark ramp.

4,522,242

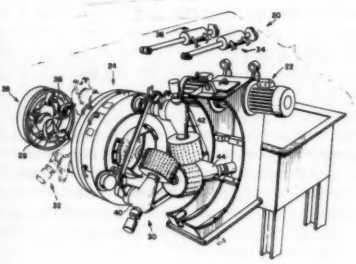
HYDRAULIC FED LOG DEBARKER

James H. Hutson, Rte. 4, Box 925, Pell City, Ala. 35125

Filed Sep. 30, 1982, Ser. No. 430,794

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—208 E **7 Claims**



1. A log debarker comprising:

a frame,

a stator supported by said frame,

a rotor,

a journaling means for journaling said rotor in said stator for rotation about a longitudinal axis of said rotor,

a rotating means for rotating said rotor about said longitudinal axis,

a plurality of debarking tools attached to said rotor,

an infeed means positioned on the infeed end of said stator for feeding logs axially into said rotor,

an outfeed means positioned on the opposite outfeed end of said stator,

a lubricating means that uses a lubricant for lubricating said journaling means,

a flushing means that uses said lubricant of said lubricating means as a flushing medium for flushing contaminants from said journaling means, and

a pumping means for pumping said lubricant over said journaling means.

4,522,243

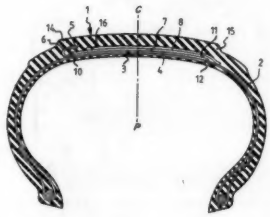
REINFORCING BELT FOR TIRES WITH A RADIAL CARCASS

Michel C. Eveque-Mourroux, Diekirch, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 2, 1984, Ser. No. 585,749

Int. Cl.³ B60C *9/20, 9/22*

U.S. Cl. 152—528 **7 Claims**



1. A reinforcing belt for pneumatic tires comprising two plies of steel cords oriented at opposite angles of between 15° and 25° with the mid-circumferential plane of the tire, whereby the radially innermost ply of steel cords is a folded ply comprising a main body portion which extends substantially over the whole tread width and having only a single folded portion, said single folded portion being folded radially outwardly and extending over less than half the tread width thereby forming a fold in a first shoulder of the tire, and whereby the radially outermost ply of steel cords is unfolded and has a median portion and two end portions, the radially outermost ply of steel cords extends substantially over the whole of the tread width and has its first end portion lying within a bite formed by the fold of the radially innermost ply of steel cords and its second end portion situated in a second shoulder of the tire, whereby the median portion and second end portion of the radially outermost ply of steel cords have disposed radially outwardly thereof at least one layer of textile cords which layer or layers extend axially no further than the edge of the folded portion of the radially innermost ply of steel cords in the direction of the first shoulder of the tire and which layer or layers extend at least up to the edge of the radially innermost ply of steel cords in the direction of the second shoulder of the tire and whereby the textile layer or layers comprise parallel cords which make an angle with the mid-circumferential plane of the tire of between 0° and 10°.

4,522,244

BEARING BRACKET FOR OUTER-WALL VENETIAN BLINDS

Hans Brolin, Mullsjö , Sweden, assignor to AB Perma System, Mullsjö , Sweden

Filed Jun. 17, 1983, Ser. No. 505,328

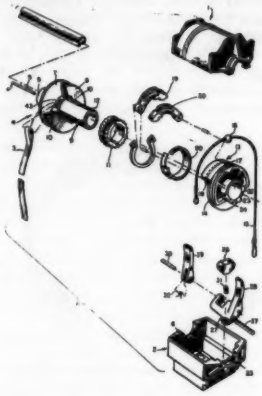
Claims priority, application Sweden, Jun. 18, 1982, 8203812; European Pat. Off., Feb. 16, 1983, 83-8500 38.7

Int. Cl.³ E06B *9/30*

U.S. Cl. 160—170 **4 Claims**

1. Bearing bracket, mainly for outer-wall Venetian blinds and comprising a lifting roll **(4)**, a turning roll **(13)** and a coupling **(11, 19, 20)**, disengagably connecting said rolls **(4, 13)**, the coupling comprising a ratchet wheel **(11)** having two rows of ratchet teeth **(35, 36)** and two pawls **(19, 20)** for cooperation with one row each of ratchet teeth **(35, 36)** on the ratchet wheel **(11)** and which during rotation of the lifting roll **(4)** carries the turning roll **(13)** to predetermined adjustment positions for the skewing of the blind laths **(40)** in which positions pawl **(19, 20)** is brought out of latching engagement with

corresponding set of teeth (35, 36) on the ratchet wheel (11) to disengage the rolls (4, 13), and further comprising a sleeve (50) arranged around the ratchet wheel (11) within which sleeve (50) the ratchet wheel (11) is rotatable, sleeve 50 having opening (56, 57) through which the teeth (33) of the pawls (19, 20) are brought into engagement with the ratchet teeth (35, 36) on



the ratchet wheel (11), sleeve (50) further including two abutments (54, 55) of which, during the rotation of the ratchet wheel (11) one or the other depending on the direction of rotation will be brought into contact with this engaged pawl (19, 20) and lifts this so that the teeth (33) thereof are free from the teeth (35, 36) on the ratchet wheel (11).

4,522,245

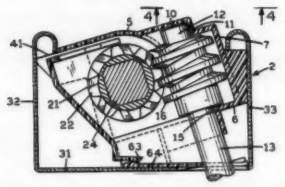
HOUSING FOR A VENETIAN BLIND TILTER MECHANISM

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Continuation-in-part of Ser. No. 455,527, Jan. 4, 1983. This application May 6, 1983, Ser. No. 492,392

Int. Cl.³ E06B *9/38*

U.S. Cl. 160—177 **12 Claims**



1. A housing for a venetian blind tilter mechanism comprising a single piece integrally molded body member comprising two spaced oppositely disposed upstanding side walls each having a rear portion and a front portion, and at least one connecting means joining said side walls, and said body member having a portion forming a top journal bearing to support an end of a rotatable tilter shaft carrying a worm gear, a portion forming a bottom journal bearing aligned with the top journal bearing for rotatably supporting a portion of the tilter shaft, two aligned apertures in said side walls adapted to form side journal bearings for rotatably supporting a worm wheel in meshing engagment with said worm gear, and said body member having an opening formed by said side walls through which said tilter shaft and worm gear may be inserted to position the tilter shaft in the bottom journal bearing and an end thereof in the top journal bearing and through which the worm wheel may be inserted and positioned in the apertures in the side walls whereby the worm wheel will be positioned in aligned meshing engagement with the worm gear.

4,522,246

PROTECTIVE COVER FOR A MACHINE BED

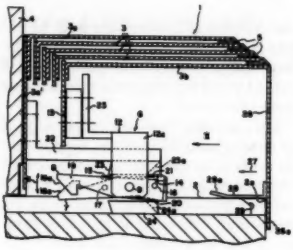
Heiner Bierbrauer, and Wolfgang Diels, both of Munich, Fed. Rep. of Germany, assignors to Gebr. Hennig GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 192,448, Sep. 30, 1980,. This application Jul. 1, 1983, Ser. No. 510,416

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941126

Int. Cl.³ E06B *3/32*

U.S. Cl. 160—223 **14 Claims**



1. In a protective cover construction for a bed of a machine tool having a part displaceable relative to the bed, said cover comprising a relatively large, a relatively small, and at least one intermediate size telescoping cover boxes overlying said bed; means securing the largest of said cover boxes to said machine part for movement therewith; and a locking mechanism operable selectively to enable and disable relative telescoping movement of said cover boxes, the improvement wherein said locking mechanism comprises a pair of pivotal, independent latching pawls carried by the smallest of said cover boxes, first retainer means fixed on said bed for latching engagement with one of said pawls to limit movement of the smallest cover box in one direction relative to said bed, and second retainer means carried by said largest box for latching engagement with the other of said pawls to couple the smallest and largest cover boxes together and prevent relative telescoping movement thereof, the arrangement being such that at any time at least one of said latching pawls is in engagement with its associated retainer means.

4,522,247

INFRARED IMAGING FOR ELECTROMAGNETIC CASTING

Gary L. Ungarean, Woodbridge, and John C. Yarwood, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 11, 1980, Ser. No. 111,244

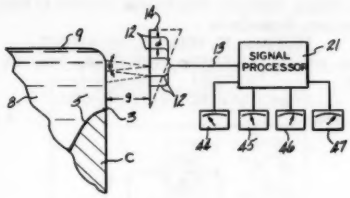
Int. Cl.³ B22D *27/02*

U.S. Cl. 164—150 **20 Claims**

1. An infrared imaging system for determining the position of the liquid-to-solid interface at the periphery of a material load in an electromagnetic casting apparatus during a casting run, said electromagnetic casting apparatus including a primary casting zone defined at least in part by the inner surfaces of an inductor and defining a solidification zone including said liquid-to-solid interface, comprising:

means for sensing and collecting infrared radiation within

said primary casting zone emanating from a vertical peripheral surface at the solidification zone of said load; and



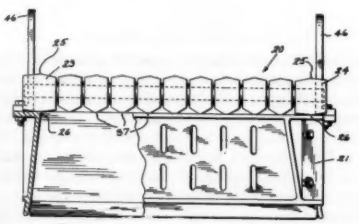
means responsive to said sensing and collecting means for providing a signal representative of the position of said liquid-to-solid interface.

4,522,248

SEGMENTED MOLD WEIGHT AND COMBINATION WITH MOLD JACKET

Wilmer J. Friesen, Hutchinson, Kans., assignor to Vulcan Engineering Co., Helena, Ala.

Filed Aug. 19, 1982, Ser. No. 409,358
Int. Cl.³ B22C *21/00*
U.S. Cl. 164—394 **6 Claims**



1. A mold weight and a mold jacket for use with foundry sand molds having an upper surface provided with at least one area of down sprues; said mold weight comprising a pair of spaced frame members, generally rigid means connecting said members, and a plurality of segmental weight elements disposed between the frame members and carried by the connecting means, said weight elements being further disposed to avoid the area for down sprues, said frame members and said weight elements being movable within limits relative to each other and the connecting means; said mold weight being supportable on the upper edge of the mold jacket; said mold weight and mold jacket being movable vertically relative to each other for respective engagement upon a sand mold and for subsequent removal from the sand mold; said mold jacket upon removal from the sand mold picking up the mold weight with vertical movement and imparting thereby a desired impact to the mold weight to rock and vibrate the weight elements and thereby loosen and clean off any sticking and caked sand picked up from the sand mold.

4,522,249

CONTINUOUS CASTING OF STEEL

Joseph A. Mulcahy, Brooklin, Canada, assignor to J. Mulcahy Enterprises Incorporated, Whitby, Canada

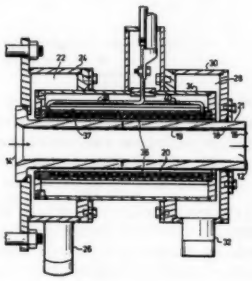
Filed Oct. 3, 1983, Ser. No. 538,216
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—466 **15 Claims**

1. In a method of continuous casting of molten metals by passing the molten metal through a cooled elongate molding zone to effect solidification of the same and removing the solidified metal from the molding zone, the improvement which comprises subjecting said molten metal in said molding zone to a rapidly pulsating high intensity magnetic field to cause inward flexure of said molten metal.

9. A molding apparatus suitable for the continuous casting of metals, comprising:

an elongate tubular mold defining a molding cavity therein, having inner and outer walls and having an inlet for molten metal at one end and an outlet for solidified metal in billet form at the other end, said mold being constructed of electroconductive material;

an annular cavity surrounding and spaced from the outer surface of the tubular mold to define an annular flow passage for the passage of cooling water from one end to the other;



first annular housing means enclosing a first cavity communicating with one end of said annular flow passage and also communicating with an inlet for cooliing water;

second annular housing means enclosing a second cavity communicating with the other end of said annular flow passage and also communicating with an outlet for cooling water;

an electrical coil associated with said tubular mold to apply a magnetic field to said mold upon the passage of an electrical current therethrough, and

means for applying a pulsating d.c. current to said electrical coil to produce a pulsating high intensity magnetic field which induces movement of said mold to decrease the cross-sectional dimension of said molding cavity.

4,522,250

CONTINUOUS CASTING WITH GLYCEROL TRIOLEATE PARTING COMPOSITION

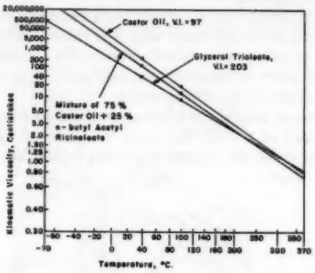
Joseph T. Laemmle, Delmont; John Bohaychick, New Kensington, both of Pa., and Willie Lansdale, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 29, 1982, Ser. No. 454,268
Int. Cl.³ B22D *11/07*
U.S. Cl. 164—472 **12 Claims**

1. A process for the continuous casting of aluminum and its alloys wherein molten metal is cast into a cooled mold having a lubricated inner mold wall, said process comprising the steps of

(a) lubricating an inner wall of a cooled, continuous casting mold with a parting composition consisting essentially of at least about 50 wt% glycerol trioleate, about 0–5 wt% of an oxidation inhibitor and about zero to an effective concentration of a biocide, and

(b) casting a molten metal comprising aluminum or an aluminum base alloy into said mold, whereby said parting com-


Castor Oil, VI. +97
Glycerol Triolate, VI.+203
Mixture of 75 % Castor Oil + 25 % n-butyl Acetyl Ricinoleate
Kinematic Viscosity, Centistokes
Temperature, °C.

position reduces the frequency of hot tears on the surface of the cast metal and has a reduced consumption rate.

4,522,251

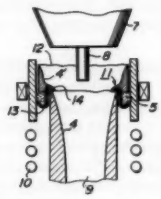
METHOD OF INCREASING CASTING WIDTH FOR A SLAB DURING A CONTINUOUS CASTING OPERATION

Takao Koshikawa; Tsunehiro Ueda, and Tadao Ozeki, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation-in-part of Ser. No. 56,092, Jul. 9, 1979, abandoned, and Ser. No. 276,715, Jun. 23, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,646

Int. Cl.³ B22D *11/04*

U.S. Cl. 164—491 **5 Claims**



1. A method of increasing the width of a slab during a continuous casting operation, comprising:

providing a tapered casting mold having a narrow side;

pouring molten steel into the mold to produce a continuously cast slab;

stopping temporarily the pouring of the molten steel and the casting of the slab;

moving the narrow side of the mold to a predetermined width corresponding to a predetermined increased width of the slab, so as to form a space between the narrow side of the mold and the solidified shell of the slab;

inserting into the space, a closing member provided with a curved metal plate and suspenders, the metal plate having a length 0–2 mm shorter than the thickness of the slab, and a width 1–5 mm smaller than the increased width of the slab at the location of the closing member, but being substantially the same as the increased width of the slab at the lower end of the mold;

engaging the suspenders with the upper edge of the solidified shell of the slab;

filling a cooling and sealing material in the space formed on the closing member, up to a height of one-half of the suspended length of the closing member, and forming a clearance of 1–5 mm between the closing member and the narrow side of the mold; and

starting again the pouring of the molten steel and the casting of the slab, followed by the drawing out thereof.

4,522,252

METHOD OF OPERATING A LIQUID-LIQUID HEAT EXCHANGER

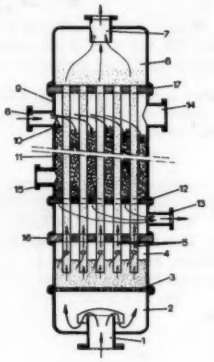
Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil B.V., Amsterdam, Netherlands

Filed May 17, 1983, Ser. No. 495,517

Claims priority, application Netherlands, May 21, 1982, 8202096

Int. Cl.³ F28C *3/16*; F28F *9/24*

U.S. Cl. 165—1 **5 Claims**



1. Method for improving the speed of passage of a second heat-exchanging medium in operating a liquid-liquid heat exchanger comprising the steps of passing a first heat exchanging medium upwardly through a plurality of upwardly directed tubes while a granular mass is kept fluidized in said tubes by the flow of the first medium and passing a second heat-exchanging medium downwardly through a chamber through which said tubes extend spaced apart whereby heat-exchange takes place in the chamber through the tube walls, said chamber containing around and betwwen the tubes a loosely packed solid particulate ceramic filling material through which the second medium flows, and the longitudinal superficial velocity of the second medium between the tubes ($U_{l,s}$) satisfying the relation $0.05 < U_{l,s} < 0.25$ m/sec.

4,522,253

WATER-SOURCE HEAT PUMP SYSTEM

Bennett Levin, Narberth, Pa., assignor to The Bennett Levin Associates, Inc., Philadelphia, Pa., Retirement Plan Trust

Filed Aug. 10, 1983, Ser. No. 521,928

Int. Cl.³ F24F *3/14*

U.S. Cl. 165—18 **10 Claims**

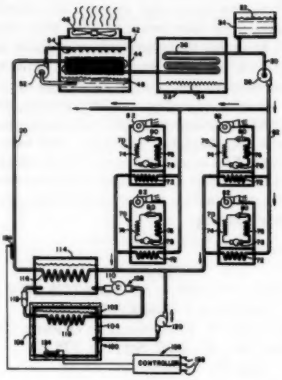
1. A heat pump system for efficiently heating and cooling a plurality of zones, comprising:

a circulation conduit for circulating a heat transfer fluid in a loop including a controllable fluid heater, a controllable fluid cooler and a pump for forcing the fluid around the loop, the fluid having a first temperature;

a plurality of zone heat pumps, each disposed between an individual zone of the plurality of zones and the circulation conduit, each of the zone heat pumps having means for controllably transferring heat in both directions between the fluid and the individual zone;

a heat storage loop including a connecting heat pump having an evaporator in heat transfer contact with the fluid in the circulation conduit and a condenser in heat transfer contact with a heat storage fluid in contact with a thermal reservoir, the connecting heat pump being operative to transfer heat from the heat transfer fluid in the circulation conduit to the heat storage fluid in contact with the reservoir, said heat storage fluid having a second temperature,

higher than said first temperature, whereby excess heat is concentrated and stored in a small volume; and,



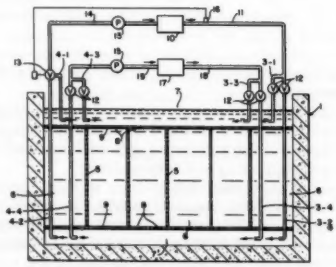
means for extracting heat from the reservoir and adding extracted heat to the heat transfer fluid in the circulation conduit.

4,522,254

HEAT STORAGE TROUGH

Hajime Koizumi; Shumpei Ohara, both of Tokyo; Kiyoshi Kouda, Funabashi; Muneshige Nagatomo; Noriyasu Sagara, both of Tokyo; Satoshi Togari, Tama, and Hiroo Izumiyama, Kodaira, all of Japan, assignors to Kajima Kensetsu Kabuhiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 419,958
Claims priority, application Japan, Sep. 30, 1981, 56-156004
Int. Cl.³ F24J *3/02*; F28D *21/00*
U.S. Cl. 165—34 **12 Claims**



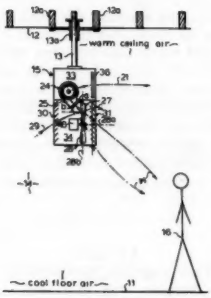
1. A heat storage device comprising: a heat transfer fluid storage tank having an interior wall surface; a vertically elongated cell within said tank having vertical wall means formed to enclose an unobstructed interior chamber, said wall means starting and terminating at its outer periphery; an upper horizontal perforated plate extending and secured about its periphery to said vertical wall means and positioned below the top edge of said tank to provide an upper storage space therebetween; and a lower horizontal perforated plate extending and secured about its periphery to said vertical wall means and positioned above the bottom of said tank to provide a lower storage space therebetween, said upper and lower plates being positioned closer to said tank top edge and said tank bottom respectively than to each other; means to transport heat transfer fluid to and from said upper storage space; means to transport heat transfer fluid to and from said lower storage space; and means to selectively regulate the flow of heat transfer fluid into and out of said upper and lower spaces; a primary heat exchanger; a secondary heat exchanger; conduit means to selectively transport heat transfer fluid from said primary heat exchanger to said upper and lower spaces; conduit means to selectively transport heat transfer fluid from said upper and lower spaces to said primary heat exchanger; conduit means to selectively transport heat transfer fluid from said secondary heat exchanger to said upper and lower spaces; and conduit means to selectively transport heat transfer fluid from said upper and lower spaces to said secondary heat exchanger.

4,522,255

SPOT THERMAL OR ENVIRONMENTAL CONDITIONER

Gary C. Baker, P.O. Box 998, Jonesboro, Ark. 72401

Filed Aug. 5, 1982, Ser. No. 405,437
Int. Cl.³ F25B *29/00*; F24F *7/007*
U.S. Cl. 165—48 R **14 Claims**



1. In a building structure having a floor and a ceiling for limiting the vertical movement of the air in the space therebetween, the air temperature in the lower level floor zone of said space being lower than that in the upper level ceiling zone, and a housing having at least one compartment therein mounted substantially between said zones, a spot thermal conditioning apparatus selectively operable in warming and cooling modes, respectively, and comprising

first power means for flowing a first mass of said warm ceiling air into said compartment;

second independent power means for concurrently flowing a second mass of said cool floor zone air into the compartment, said masses intersecting at an acute angle to form an air mixture having a temperature intermediate the temperatures of the air in said ceiling and floor zones;

said first means being positioned immediately adjacent said second means and causing said first mass to intersect said second mass in proximity to said second means;

means for varying the ratio between said flowing masses to cause predominantly warm ceiling air and subordinately cool floor air to be flowed into said mixture during the warming mode and subordinately warm ceiling air and predominantly cool floor air to be flowed into the mixture during the cooling mode, and

means for projecting a concentrated high velocity stream of said air mixture horizontally and downwardly from said compartment, said stream being tightly focused toward an open spot work area substantially surrounded by said floor zone air.

4,522,256
APPARATUS FOR THE EXTRACTION OF VAPOR FROM A MASH AND/OR WORT TUB

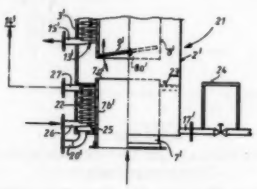
Alfons Wolfseder, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,128

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214064

Int. Cl.³ F28F *13/06*

U.S. Cl. 165—103 **13 Claims**



1. Apparatus for extracting vapor from a mash or wort tub having a vapor delivery pipe through which said vapor flows, said apparatus comprising an upright housing closed at its bottom by a wall through which said delivery pipe extends, said housing having an external side wall encircling a vapor vent pipe having its lower end in spaced, substantially axial alignment with said vapor delivery pipe, said vent pipe being spaced from said side wall to form with said bottom wall a condensing chamber between said side wall and said vent pipe; helical tube condenser means accommodated in said condensing chamber; valve means mounted adjacent the lower end of said vent pipe for selectively directing vapor issuing from said delivery pipe to said chamber, or to said vent pipe, or to both; and means at the bottom of said chamber for draining condensate therefrom.

4,522,257
TUB VAPOR CONDENSER

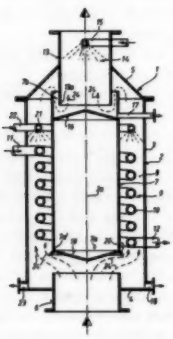
Alfons Wolfseder, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,162

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214065

Int. Cl.³ F28B *3/04*

U.S. Cl. 165—113 **13 Claims**



1. A two stage condenser for use with vapours gas rising from a mash or wort tub, said condenser comprising an upright hollow housing having a side wall, a bottom, and a cover; a hollow body within said housing having a peripheral wall and bottom wall; a vent pipe sealingly extending through the bottom of said housing, said peripheral wall of said body and said side wall of said housing defining an annular chamber therebetween in communication with said vent pipe; a vent tube sealingly extending through said cover and projecting into said hollow body from the upper end thereof, the cross-sectional dimension of said vent tube being smaller than that of said peripheral wall to define therebetween an annular passage in communication with said annular chamber; a deflector within said body adjacent said vent tube for deflecting into the latter gas from said annular chamber; cooling means within said annular chamber for cooling said gas and condensing vapour therefrom; means for spraying a liquid into said vent tube and onto said deflector; first extraction means for extracting liquid collected on said deflector; and second extraction means independent of said first extraction means for extracting condensate from said annular housing.

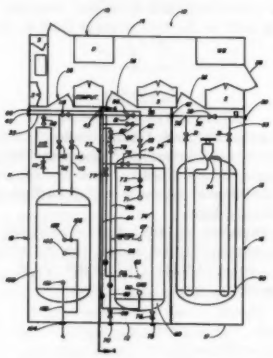
4,522,258
UNITIZED WELL TESTING APPARATUS FOR USE IN HOSTILE ENVIRONMENTS

Jack J. DeWald, 7323 W. Roadway, New Orleans, La. 70124

Filed May 14, 1982, Ser. No. 378,107

Int. Cl.³ E21B *43/00, 43/34*

U.S. Cl. 166—57 **9 Claims**



1. A modular well testing unit for use in hostile environments, comprising:

a. a plurality of modular sections providing upon assembly a composite, unitized, enclosed structure for housing the components of the well testing unit, each modular section being self supporting and transportable;

b. means for assembling the modular sections together to form the composite, unitized, enclosed structure;

c. wall and insulation means for each of the units which are adapted to provide upon assembly of the modular sections an internal controlled environment surrounded by a substantially continuous external shell;

d. internal access means between adjacent sections for allowing access between adjacent modular sections without traveling outside the external shell;

e. production fluid intake means for intaking a production gas/fluid stream from an oil/gas well to be tested;

f. crude oil outlet means for discharging oil from the assembled enclosure;

g. a plurality of well testing fluid handling components comprising at least in part heat exchanger means, surge tanks, transfer pump and separator means for separating the production stream into components disposed respectively in said modular sections; and

h. manifold means in each modular unit for forming fluid flow connections between the outlet means, the inlet means and the components, said manifold means including connection means for forming easily detachable direct

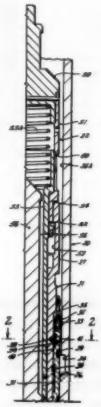
fluid conveying connections between adjacent modular units so that the manifold means for all the modular units can be connected without traveling outside the external shell.

4,522,259

WELL APPARATUS

Neil H. Akkerman, Kingwood, Tex., assignor to AVA International Corporation, Houston, Tex.

Filed Apr. 29, 1983, Ser. No. 489,827
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—237 **55 Claims**



1. For use in a well string having a well conduit with a locking groove and a cylindrical bore, apparatus comprising a wire line running tool, a well tool including a body releasably connectible to the running tool for lowering therewith into the well string, locking means carried by the body in normally contracted position, sensing means carried by the body, and means responsive to movement of the sensing means into engagement with the bore for enabling the locking means to be expanded into the locking groove, and, when the locking means is so expanded, enabling the running tool to be released from connection to the body upon further manipulation of the running tool.

4,522,260

METHOD FOR CREATING A ZONE OF INCREASED PERMEABILITY IN HYDROCARBON-CONTAINING SUBTERRANEAN FORMATION PENETRATED BY A PLURALITY OF WELLBORES

Herbert B. Wolcott, Jr., Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 366,510, Apr. 8, 1982, Pat. No. 4,446,918. This application Feb. 23, 1984, Ser. No. 583,065
Int. Cl.³ E21B *43/24, 43/247, 43/30*
U.S. Cl. 166—245 **13 Claims**

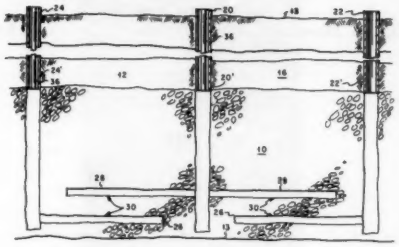
1. A method for creating a zone of increased permeability in a subterranean hydrocarbon-containing formation selected from the group consisting of tar sands, heavy oil-containing formations, oil shales and tight gas reservoirs penetrated by a plurality of wellbores, said method consisting essentially of:

(a) penetrating said formation with a first wellbore;

(b) positioning a plurality of other wellbores about said first wellbore, each of said other wellbores having at least one substantially horizontal borehole extending therefrom into the vicinity of said first wellbore;

(c) extending a plurality of substantially horizontal boreholes from said first wellbore into the vicinity of said other wellbores

(d) positioning explosive charges in at least a portion of said boreholes; and,



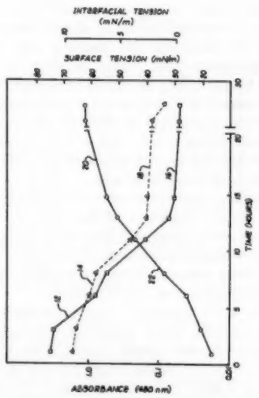
(e) detonating the explosive charges to produce a rubblized zone between said first wellbore and said other wellbores.

4,522,261

BIOSURFACTANT AND ENHANCED OIL RECOVERY

Michael J. McInerney; Gary E. Jenneman; Roy M. Knapp, and Donald E. Menzie, all of Norman, Okla., assignors to The Board of Regents for the University of Oklahoma, Norman, Okla.

Filed Apr. 5, 1983, Ser. No. 482,308
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—246 **22 Claims**



1. A process for enhancing the amount of oil recoverable from a waterflooded oil-containing formation comprising:

injecting a quantity of viable *Bacillus licheniformis* strain JF-2 cells into the waterflooded oil-containing formation; and

injecting a quantity of *Bacillus licheniformis* strain JF-2 nutrient into the waterflooded oil-containing formation.

17. A process for enhancing the amount of oil recoverable from a waterflooded oil-containing formation comprising:

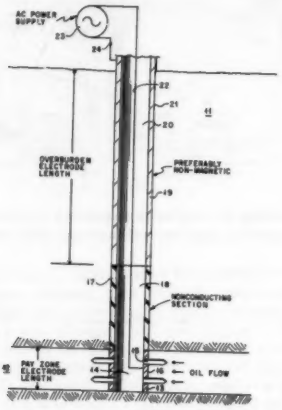
injecting a quantity of lichenysin into the oil-containing formation.

4,522,262

SINGLE WELL ELECTRICAL OIL STIMULATION

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 30, 1983, Ser. No. 509,736
Int. Cl.[3] E21B *36/04, 43/24*
U.S. Cl. 166—248 9 Claims



1. In a single well method of applying heat to a subsurface formation containing a viscous hydrocarbonaceous material to stimulate oil production therefrom, said subsurface formation being overlain by an overburden, the improvement comprising the steps of:

(a) causing an alternating current to flow between a lower metal electrode of relatively small surface area located essentially in said subsurface formation and an upper tubular metal electrode of relatively large surface area located in said overburden, said upper electrode being essentially comprised of an electrically conductive nonmagnetic metal thereby causing said current to flow through said upper electrode with reduced hysteresis losses in said upper electrode in comparison to the hysteresis losses that would occur if said upper electrode were essentially comprised of steel, at least a part of said lower electrode being tubular and being connected at its upper end to the lower end of an electrically nonconducting tubular isolation means; and

(b) producing hydrocarbonaceous fluid through said lower electrode to the surface of the earth.

7. Apparatus for applying heat to a subsurface formation containing a hydrocarbonaceous material, said subsurface formation being overlain by an overburden, comprising:

(a) alternating current power source;

(b) lower steel electrode means positioned opposite said formation, said lower electrode means being electrically connected to said power source, at least a portion of said lower electrode means being tubular in shape, the outer surface of said lower electrode being in contact with said formation;

(c) upper electrically conductive nonmagnetic metal electrode means positioned in said overburden, said upper electrode means being electrically connected to said power source, said upper electrode being predominantly tubular in shape, the outer surface of said upper electrode means being in contact with said overburden; the surface area of said upper electrode means being at least five times larger than the surface area of said lower electrode means; and

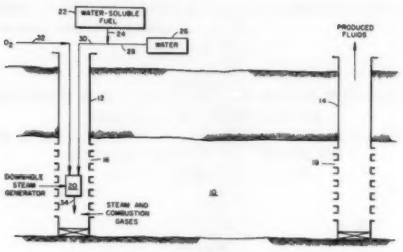
(d) electrically nonconductive tubular-shaped intermediate isolation means connected at its lower end to said lower electrode means.

4,522,263

STEM DRIVE OIL RECOVERY METHOD UTILIZING A DOWNHOLE STEAM GENERATOR AND ANTI CLAY-SWELLING AGENT

Daniel N. Hopkins, Dallas, and Earl S. Snavely, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,094
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[3] E21B *43/24*
U.S. Cl. 166—272 29 Claims



1. In a method of recovering viscous oil from a subterranean, permeable, viscous oil-containing formation, said formation being penetrated by at least one injection well and at least one spaced-apart production well, said wells in fluid communication with a substantial portion of the formation, comprising:

(a) mixing a water-soluble fuel with water containing an anti clay-swelling agent;

(b) injecting said mixture of water-soluble fuel dissolved in water containing an anti clay-swelling agent under pressure into a steam generation zone in said injection well;

(c) injecting substantially pure oxygen into said steam generation zone under pressure via said injection well which contacts the pressurized mixture of water-soluble fuel and water thereby effecting spontaneous combustion of said fuel to generate a mixture of wet steam and combustion gases that pass through the formation, displacing oil and reducing the oil's viscosity; and

(d) recovering fluids including oil from the formation via the production well.

15. In a method for recovering viscous oil from a subterranean, permeable, viscous oil-containing formation, said formation being penetrated by at least one well, said well in fluid communication with a substantial portion of the formation, comprising:

(a) mixing a water-soluble fuel with water containing an anti clay-swelling agent;

(b) injecting said mixture of water-soluble fuel dissolved in water containing an anti clay-swelling agent under pressure into a steam generation zone in said injection well;

(c) injecting substantially pure oxygen into said steam generation zone under pressure via said well which contacts the pressurized mixture of water-soluble fuel and water thereby effecting spontaneous combustion of said fuel to generate a mixture of wet steam and hot combustion gases that pass through the formation, displacing oil and reducing the oil's viscosity;

(d) continuing injecting said pressurized mixture of water-soluble fuel dissolved in water and substantially pure oxygen for a predetermined period of time; and

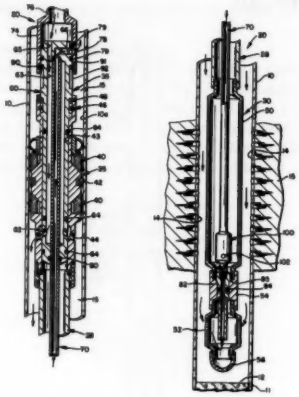
(e) thereafter, discontinuing fluid injection of step (d) and opening said well to production so that fluids including oil are recovered from the formation.

4,522,264

APPARATUS AND METHOD FOR TREATING WELLS

Johnny C. McNeer, Lake Charles, La., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 2, 1983, Ser. No. 529,165
Int. Cl.³ E21B *43/04, 43/10*
U.S. Cl. 166—278 **22 Claims**



1. Apparatus for treating a well, comprising:
a. well packer means;
b. well screen means connected below said packer means;
c. means providing lateral flow port means between said packer means and said screen means; and
d. service seal unit tool means attached to said packer and attachable to a pipe string, said service seal unit tool means including:
i. tubular body means telescopically engaged in said packer means,
ii. means on said tubular body means sealing both above and below said lateral port means,
iii. tubular wash pipe means extending through said tubular body means and said packer and having its upper end opening outwardly into the well annulus above the packer while its lower end opens into said screen means, said wash pipe having a lateral circulation port in its wall communicating with the interior of the screen means,
iv. means sealing between the screen means and the wash pipe below said lateral circulation port, and
v. means initially closing said lateral circulation port said means being movable to port-open position automatically when the pressure exterior of the wash pipe exceeds the pressure interior thereof by a predetermined amount.

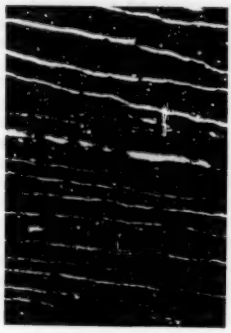
4,522,265

METHOD FOR FRACTURING OF OIL SHALE

Teh F. Yen, Altadena, and Mankin Chan, Los Angeles, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Feb. 25, 1980, Ser. No. 124,167
Int. Cl.³ E21B *43/27;* C10B *53/06*
U.S. Cl. 166—307 **10 Claims**

1. A method of treating shale to induce fracturing, said shale being a carbonaceous rock whose organic content is substantially kerogen, said shale having a gas permeability of less than 10^{-5} darcys, but having sufficient organic content and/or shallow burial, comprising the step of contacting said shale



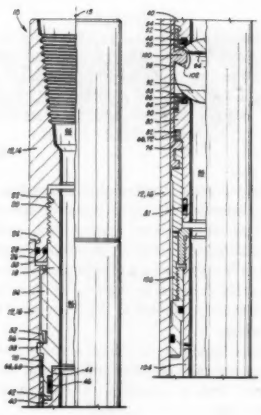
with an effective amount of an amino compound for a time sufficient to fracture said shale.

4,522,266

DOWNHOLE TESTER VALVE WITH RESILIENT SEALS

Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 5, 1982, Ser. No. 355,231
Int. Cl.³ E21B *34/06*
U.S. Cl. 166—330 **9 Claims**



1. A downhole tool apparatus comprising:
a cylindrical downhole housing;
a ball valve disposed in said housing;
an operating means, operatively associated with said ball valve for rotating said ball valve within said housing upon relative longitudinal movement between said operating means and said ball;
first and second seat holder assemblies disposed on diametrically opposite sides of said ball valve, said first seat holder assembly including:
a first seat holder;
a first seat retainer detachably connected to said first seat holder to define a first annular groove for receiving first seat; and
an annular resilient first seat captured in said first annular groove so that said first seat holder and first seat retainer must be disconnected to remove saif first seat from said

first annular groove, and wherein said first seat extends out of said first annular groove so that said ball valve engages said first seat without engaging said first seat holder or said first seat retainer; and

adjustable holding means, operably associated with said first and second seat holder assemblies, for holding said first and second seat holder assemblies in place on said opposite sides of said ball valve, said holding means being adjustable via a threaded connection between two parts thereof to vary a compressional preload of said first seat and of an annular resilient second seat of said second seat holder assembly against said ball valve, said adjustable holding means including:

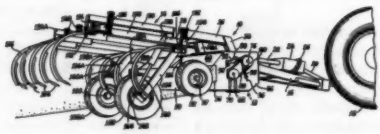
a cylindrical collar having said ball valve and portions of said first and second set holder assemblies disposed therein, said collar having a longitudinal opening through which a pin of said operating means extends, said collar being one of said two parts forming threaded connection.

4,522,267

SHREDDER/PLOW COMBINATION

Richard A. Lewison, Pocahontas, Iowa, assignor to Ronald D. Wetherell, Cleghorn, Iowa

Filed Dec. 13, 1982, Ser. No. 448,937
Int. Cl.³ A01B *49/04*
U.S. Cl. 172—28 **19 Claims**



1. A shredder/plow combination adapted to be drawn by a tractor in an intended direction of travel, said tractor having a source of hydraulic power, a rear hitch and a rear power takeoff, said shredder/plow combination comprising:

a trailer hitch frame having a rear end and a front end adapted to be securely coupled to the rear hitch of said tractor;

a shredder assembly coupled to the rear end of said hitch frame and including:

a housing wherein is mounted a rotor having an axis of rotation generally perpendicular to said intended direction of travel and a plurality of cutting blades mounted thereon; and

an upwardly arched structural member coupled to and positioned generally above and supporting said housing and including an aft portion and a forward portion, with said structural member including an upwardly extending forward support element coupled to the rear end of said frame, an upwardly extending rear support element and a generally horizontally oriented center support element coupling said forward and rear support elements with said rear support element having a coupling means thereon;

power coupling means for connecting the rear power takeoff off said tractor to said rotor for angularly displacing said cutting blades;

a toolbar assembly including a plow unit mounted thereon, said toolbar assembly including a forward portion thereof coupled to said rear coupling means of said rear support element of said structural member, and transport wheels coupled to said assembly.

4,522,268

PACKER WHEEL

George H. Morris, and Douglas C. Nicholls, both of Yorkton, Canada, assignors to Morris Rod Weeder Co. Ltd., Yorkton, Canada

Filed Dec. 6, 1982, Ser. No. 447,414
Int. Cl.³ A01C *7/20, 13/00*
U.S. Cl. 172—518 **16 Claims**

1. A packer wheel comprising:

a central hub;

a pair of spaced, relatively thin, dish-shaped, generally parallel sheet metal sides having continuous, outermost, inturned margins terminating in opposed, continuous, circular edges disposed in spaced, facing relationship,

said margins converging inwardly and being transversely arcuate, presenting outermost convex surfaces and cancave innermost surfaces,

each side having the margin and the edge thereof integral therewith,

said sides being in circumscribing engagement with the hub and being welded directly thereto in concentric relationship thereto;

a rigid, strengthening annulus of metallic material disposed between said sides medially thereof in surrounding relationship to the hub, said annulus in its entirety being spaced from the hub, and being supported solely by said margins,

said annulus having a continuous, annular periphery proximal to said edges and concentric to the hub;

weld means rigidly uniting the annulus and the sides adjacent said periphery and said edges, and extending radially outward from said margins; and

a peripheral, outwardly extending, ground-engaging, blunt, ground-packing wear rim bearing the load carried by said wheel against the ground,

said weld means continuing uninterruptedly throughout the circumference of said sides.

4,522,269

DUAL MOTOR TORQUE DELIVERING TOOL

Nils G. Adman, Huddinge, and Rolf A. Jacobsson, Johanneshov, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 18, 1982, Ser. No. 442,769
Claims priority, application Sweden, Nov. 23, 1981, 8106935
Int. Cl.³ B23Q *5/06*
U.S. Cl. 173—12 **6 Claims**

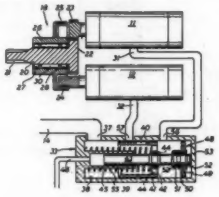
1. In a pneumatic power tool for tightening threaded joints, comprising a housing (10), an air supply passage (14) in said

housing (10) communicating with an external pressure air source, a primary motor (11) for obtaining an initial degree of pretension in the joint, a secondary motor (12) for obtaining together with said primary motor (11) the desired final degree of pretension in the joint, said primary and secondary motors (11, 12) each having an air inlet, and a power train (18, 19) for transmitting the power of said primary motor (11) and said secondary motor (12) to an output spindle connectable to the joint,

the improvement comprising:

an air supply valve (33; 133) which includes a cylinder bore (38; 138) in the housing (10) and a valve element (39; 139) which is sealingly guided in said cylinder bore (38; 138),

said cylinder bore (38; 138) having an inlet port (37; 137) communicating with said air supply passage (14), a first service port (56; 156) communicating with said air inlet of



said primary motor (11), and a second service port (57; 157) communicating with said air inlet of said secondary motor (12),

said valve element (39; 139) being arranged in said clyinder bore (38; 138) to control only said second service port (57; 157), said valve element (39; 139) being shiftable between a second service port (57; 157) covering position and a second service port uncovering position, and

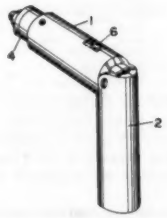
said valve element (39; 139) being balanced between the air pressure in said air supply passage (14) and the back pressure from said primary motor (11) such that an increased back pressure from said primary motor (11) as said initial degree of pretension is reached causes said valve element (39; 139) to move from said second service port covering position to said second service port uncovering position, thereby energizing said secondary motor (12).

4,522,270

HAND-HELD ELECTRIC TOOL

Ichiro Kishi, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 30, 1983, Ser. No. 509,773
Claims priority, application Japan, Jul. 16, 1982, 57-124706
Int. Cl.³ B25G *1/00*
U.S. Cl. 173—163 **11 Claims**



1. An electric tool adapted in use to rotatably drive a bit for fastening, drilling and like operations by an electric motor incorporated therein, comprising:

an elongated housing having a first longitudinal axis and housing said motor and a check for holding the bit, drivingly connected thereto, the chuck being accessible from the forward end of the housing;

an elongated grip having a second longitudinal axis; and

said grip being connected at its forward end to the rearward end of the housing by pivot means so as to be selectively pivotal between a straight position where the second longitudinal axis thereof is in line with the first longitudinal axis of the housing or an angled position where the second longitudinal axis thereof crosses with the first longitudinal axis of the housing;

said pivot means comprising a stationary member on either the rearward end of the housing or the forward end of the grip, and a movable member on the other of said rearward end of the housing or forward end of the grip;

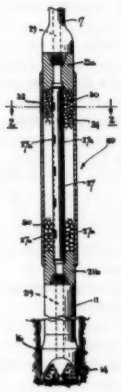
said stationary member comprising (a) a pivot tang of smaller dimension than said housing or grip, (b) a main pivot axis near the distal end of said pivot tang, (c) a retractable cover carried by said stationary member having a proximal end pivotally supported on a secondary axis parallel to said main pivot axis and a distal end projecting outwardly and parallel to said pivot tang; said movable member comprising (a) an open end encompassing the stationary member, except the retractable cover, when the tool is in its straight position; (b) means interconnecting with said main pivot axis to hinge said movable member thereon; (c) means positioned to slidably receive the distal end of said retractable cover so that when said tool is in straight position, the stationary member is substantially encompassed by the open end and the retractable cover and when said tool is in its angled position, the major portion of said retractable cover is slid into said receiving means.

4,522,271

METHOD AND APPARATUS FOR DAMPING VIBRATIONS IN DRILL COLLAR STRINGS

Albert G. Bodine, and James N. Gregory, both of 7787 Woodley Ave., Van Nuys, Calif. 91406

Filed Oct. 17, 1983, Ser. No. 542,456
Int. Cl.³ E21B *17/16*
U.S. Cl. 175—56 **9 Claims**



1. In a drill assembly having a drill bit collar string connected to the drill bit pipe for use in rotatably driving the drill collar string and bit, the improvement being means for damping vibratory energy developed in the drill collar string comprising:

an elongated jacket member connected to the drill collar string at a region thereof away from the bit having low accoustical impedance,

means for continually providing fluid communication be-

tween the interior of said jacket member and the ambient environment to facilitate the damping and,

separate pieces of mass reactive material installed within said elongated jacket for limited freedom of motion both longitudinally and laterally relative to each other and to the walls of the jacket,

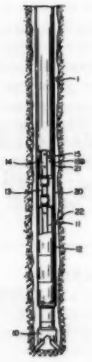
vibratory energy developed in the drill collar string being transferred to said pieces of material causing said pieces to randomly strike against each other thereby dissipating said energy.

4,522,272

APPARATUS FOR DIRECTIONAL DRILLING OF SUBTERRANEAN WELLS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Mar. 8, 1983, Ser. No. 473,185
Int. Cl.³ E21B *7/08*
U.S. Cl. 175—74 **3 Claims**



1. An apparatus for effecting directional drilling of a well bore with use of a rotary drill bit, comprising: a drive shaft extending to said rotary drill bit; a first sleeve like housing surrounding and supporting said drive shaft; a motor having an output shaft; a second sleeve like housing enclosing and supporting said motor output shaft; a universal joint connection between said motor output shaft and said drive shaft; concentric male and female threads interconnecting the upper end of first housing and the lower end of said second housing in the axial vicinity of said universal joint connection; said concentric male and female threads having common axes angularly displaced from the housing axes, whereby rotational displacement of one housing relative to the other will angularly displace the axis of the rotary drill bit to change the well bore direction; a radial shoulder formed on each of said housings at the inboard end of said male thread and on the outboard end of said female thread, a selected number of annular shims being insertable between said shoulders to determine the angular displacement of said housing upon tightening of said threads to compress said shims between said radial shoulders, the planes of said radial shoulders being respectively perpendicular to said common axes of said male and female threads.

4,522,273

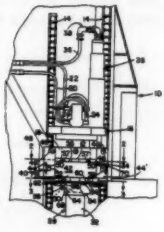
DRILLING RIG

Leslie N. Larson, P.O. Box 334, Mabel, Minn. 55954

Filed May 4, 1981, Ser. No. 260,045
Int. Cl.³ E21B *3/02, 7/20*
U.S. Cl. 175—135 **16 Claims**

1. In combination with drilling apparatus which includes a length of drill rod having an axis of elongation and a bit element at a remote axial end thereof, a drilling tower supporting the drill rod by an end opposite the remote axial end, means carried by the tower for imparting linear axial force to the drill rod in a direction toward the end of the rod at which the bit element is mounted and rotational movement to the drill rod about its axis of elongation, and a segment of casing, similar in length to the drill rod, encircling the drill rod and having an end adjacent the bit element and an opposite end; a device for driving the casing into a hole formed by the bit element to provide an inner retaining wall therefor, comprising:

(a) a percussion assembly mounted to the tower and having a piston laterally spaced from the axis of the drill rod, said piston being disposed for rapid cyclic reciprocation along an axis generally parallel to the axis of the drill rod;



(b) a rigid lever member normally disposed generally transverse to the drill rod and extending between first and second ends, diametrically opposed about the drill rod, and around the drill rod;

(c) means pivotally mounting said member to the tower for receipt of the linear axial force and by said first end for pivoting thereabout, with said second end positioned to be strikingly engaged on an anvil side of said member by said piston as it reciprocates; and

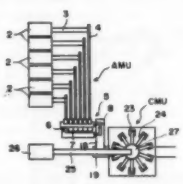
(d) a percussion transmission element disposed axially intermediate said lever member and the casing, said element having a first shoulder axially engaged by a side of said lever member facing oppositely from said anvil side and a second shoulder axially engaging the end of the casing opposite the end adjacent the bit element.

4,522,274

COMBINATORIAL WEIGHING METHOD

Satoshi Konishi, Shiga, and Takashi Sashiki, Nagaokakyo, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 5, 1982, Ser. No. 439,595
Claims priority, application Japan, Nov. 10, 1981, 56-180674
Int. Cl.³ G01G *19/22, 13/02*
U.S. Cl. 177—25 **13 Claims**



1. A combinatorial weighing method for obtaining a final mixture of articles of plural categories, in which the articles in each category are contained in the mixture at a number ratio equal or closest to a target number ratio, the final mixture having a total weight equal or closest to a target weight, said method comprising the steps of:

(a) setting a number of articles for each category of articles

to provide a primary number ratio close to the target number ratio;

(b) measuring the total weight of a primary mixture obtained by extracting the set number of articles in each category determined in said step (a) and mixing these articles together;

(c) computing a weight shortfall by finding the difference between the total weight of the primary mixture and the target weight;

(d) supplying a plurality of weighing machines with supplemental articles which are used to compensate for the weight shortfall, and selecting an optimum combination of weighing machines giving a combined weight equal or closest to the weight shortfall; and

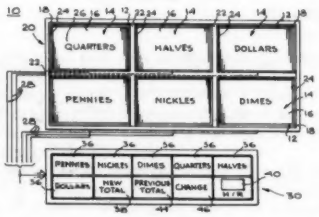
(e) obtaining a final mixture by discharging the supplemental articles from the selected weighing machines forming the optimum combination and mixing these supplemental articles with the primary mixture.

4,522,275

CASH TOTALIZING APPARATUS AND METHOD

Norman L. Anderson, 14160 Redhill Ave. #16, Tustin, Calif. 92680

Filed Jan. 16, 1984, Ser. No. 571,113
Int. Cl.³ G01G *23/22, 19/52, 19/00*
U.S. Cl. 177—25 **16 Claims**



1. An improved cash totalizing apparatus, said apparatus comprising, in combination:

a plurality of separate weight-responsive electronic measuring means, each of said electronic measuring means being adapted to be connected to a different one of a plurality of coin compartments and to generate a signal indicative of the weight of coins in said compartment;

an electronic totalizer display unit interconnected to said electronic measuring means and responsive to said signals, said unit having computing means and display means for depicting at least one of the number of coins in each said compartment and the monetary sum of the coins in each said compartment, and at least one of the present total monetary sum of all coins in said compartments and the total monetary sum of all coins added to or removed from said compartments during a predetermined transaction time period.

4,522,276

INDIVIDUAL NUCLEAR FUEL ROD WEIGHING SYSTEM

James L. Fogg, Columbia; George E. Vining, West Columbia; John H. Smith, and Cecil A. Howell, both of Columbia, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

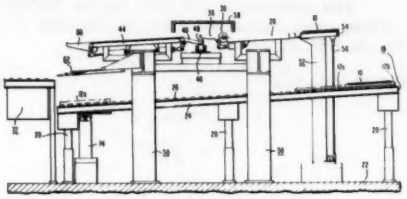
Filed Jun. 20, 1983, Ser. No. 505,669
Int. Cl.³ G01G *19/00, 23/02;* **B65G** *11/33*
U.S. Cl. 177—145 **10 Claims**

1. A system for individually weighing nuclear fuel rods carried on a tray moving from a beginning position to an end position along a length of a materials handling conveyor, comprising:

(a) an overhead ramp disposed above said materials handling conveyor;

(b) means for lifting said rods from said tray, when said tray is at said beginning position, and placing them on said overhead ramp;

(c) a scale fixedly disposed above said materials handling conveyor;



(d) means for loading said rods, one at a time, from said overhead ramp onto said scale for individual weighing; and

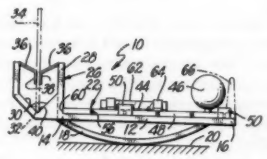
(e) means for transferring each weighed said rod from said scale to said tray, when said tray is at said end position.

4,522,277

ROCKING SCALE

Bernard Kotzin, 510 Anderson St., Manhattan Beach, Calif. 90266

Filed Apr. 22, 1983, Ser. No. 487,723
Int. Cl.³ G01G *1/36, 21/22*
U.S. Cl. 177—250 **6 Claims**



1. A weighing device including a body having opposed ends, support means located on said body for supporting said body in a horizontal position on a surface in such a manner that said body can tilt so that either of said ends is higher than the other and holding means for holding an object to be weighed located adjacent to one of said ends of said body in which the improvement comprises:

a counterbalance member located on said body,

guide means on said body holding said counterbalance member so that it can be moved towards and away from said holding means,

indicia means for indicating weight of an object held by said holder by the position of said counterbalance member on said body,

the position of said end of said body upon which holding means is located relative to the position of the other end of said body indicating the weight of an object held by said holder more or less than a specific value indicated by said indicia means,

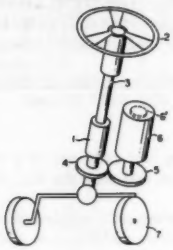
said indicia means serving to indicate the weight of an object held in said holder when the position of said body relative to said surface is horizontal,

said holding means is only capable of holding an envelope vertically at a specific distance along the horizontal line of the location where said support means engages said surface when the position of said body is horizontal.

4,522,278
TORQUE SENSOR

Junji Kitagawa; Shigeyuki Akita, both of Okazaki; Norimichi Kasegawa, Susono, and Akira Nakamura, Shizuoka, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 325,484, Nov. 27, 1981, Pat. No. 4,448,275.
This application Feb. 15, 1984, Ser. No. 580,186
Claims priority, application Japan, Nov. 28, 1980, 55-168709; Dec. 26, 1980, 55-186270
Int. Cl.³ B62D 5/04
U.S. Cl. 180—79.1 7 Claims



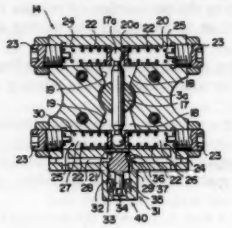
1. A torque sensor comprising:
a first rotor capable of being suitably driven for rotation;
first sensing means provided on said first rotor, for detecting the rotation thereof;
a second rotor provided in the neighborhood of said first rotor and rotatable with respect thereto;
a torsion bar mechanically coupling said first and second rotors;
second sensing means provided on said second rotor and disposed orthogonally to said first sensing means to couple with said first sensing means electromagnetically and to generate an electric signal according to the degree of the electromagnetic coupling between said two rotors variable with relative rotation of said rotors caused via said torsion bar; and
an electric processing circuit for receiving the signal from said second sensing means and generating a signal corresponding to the magnitude of the twist of said torsion bar according to the received signal.

4,522,279
STEERING DEVICE FOR A VEHICLE

Hirotaka Kanazawa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Mar. 21, 1983, Ser. No. 477,635
Claims priority, application Japan, Mar. 24, 1982, 57-47848; Apr. 21, 1982, 57-67879; Jul. 20, 1982, 57-127136; Jul. 20, 1982, 57-127137; Jul. 31, 1982, 57-134320
Int. Cl.³ B62D 1/20
U.S. Cl. 180—143 9 Claims

1. A steering device for a vehicle having a steering wheel operatively connected to dirigible wheels of the vehicle by way of a steering linkage so that the dirigible wheels are turned in response to rotation of the steering wheel wherein a rotating portion of the steering linkage which is rotated to transmit the steering force of the steering wheel upon rotation of the steering wheel is divided into first and second parts, and the first and second parts are connected by way of resilient means and a damper, the resilient means being adapted to be elastically deformed to produce a rotational displacement between the first and second parts of the rotating portion upon rotation of the steering wheel, said steering device having an adjustment

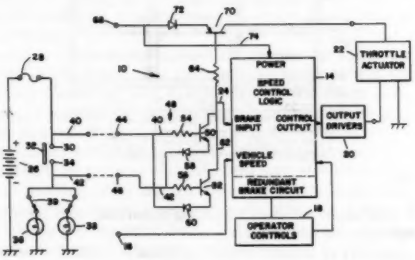


means for changing the damping characteristics of said damper according to the speed of the vehicle.

4,522,280
AUTOMATIC DISENGAGEMENT DEVICE FOR AUTOMOTIVE CRUISE CONTROL SYSTEM

Peter G. Blaney, Walnut Creek, Calif., assignor to Zemco, Inc., San Ramon, Calif.

Filed Jun. 18, 1982, Ser. No. 389,684
Int. Cl.³ B60K 31/00
U.S. Cl. 180—175 2 Claims



1. In a vehicle having a cruise control system and a brake system including a brake switch operable by a pedal and having two contacts, one of which is connected to a power source and the other of which is connected to ground potential, said cruise control system included a logic control section with a set speed input, an actual speed input and providing an output for controlling a throttle actuator to maintain a preselected set speed, and a power lead means connecting a vehicle power bus with said throttle actuator, the improvement of an automatic disconnect device comprising:
an exclusive NOR circuit having a pair of input leads each connected to one contact of said brake switch, a pair of transistors, the base of each transistor being connected to one said input lead, the emitters of each transistor being connected to the opposite input lead, and the collectors connected in parallel to a single output lead that is connected to said control logic section;
a switching transistor in series with said power lead means and a control resistor connected between the base of said switching transistor and said output lead of said exclusive NOR circuit, said output lead normally being held at a low potential by said exclusive NOR circuit which also provides the bias necessary through said control resistor to said switching transistor to cause power to be transmitted from said vehicle power bus to said throttle actuator;
whereby when the vehicle brake switch is closed or if it malfunctions to destroy a return path to ground, said exclusive NOR circuit will cease conducting, thereby

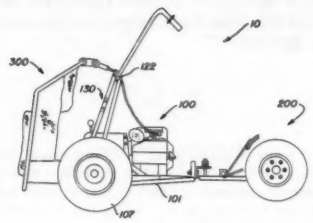
allowing said output lead to be pulled to a high potential by the lack of current through said control resistor and providing a primary disengage signal to said control logic section while also removing sufficient bias from said switching transistor to cause it to cease conduction and disconnect said power lead means from said throttle actuator, thereby poviding a secondary safety disengagement for the cruise control system.

4,522,281

MOTORIZED COLLAPSIBLE GOLF CART

William R. Snider, 3238 St. Charles Dr., Steubenville, Ohio 43852

Filed Apr. 20, 1983, Ser. No. 486,778
Int. Cl.³ B62D *55/16*
U.S. Cl. 180—208 **5 Claims**



1. an improved golf cart construction comprising three major components, wherein:

the first major component comprises; a wheeled platform member having a platform mounted above an axle; a brake machanism; and, an elongated rod mounted on the forward end of the platform;

the second major component comprises; a wheeled power member, having an axle mounted above a tubular framework that provides a support surface for a power mechanism, wherein one end of the tubular framework is dimensioned to rest on the rear portion of the said platform when the first and second major components are disassembled; a folding handle assembly comprising a generally V-shaped handle bar member; wherein both the lower portion and the handle bar member are pivotable with respect to the said power mechanism; and, a coupling bracket adapted to connect the said first major component to the second major component, wherein the coupling bracket comprised a generally C-shaped apertured bracket mounted on the rear of the said tubular framework, and the apertures in the bracket are dimensioned to receive the elongated rod on the wheeled platform member and one end of the elongated rod is threaded and provided with a helical spring and cap member, to complete the connection between the first and second major components; and

the third major component comprises a golf club retaining device having a plurality of flexible receptacles and releasable golf club shaft engaging means disposed across a generally rectangular tubular framework, and clamping means for releasably securing said third major component to the second major component.

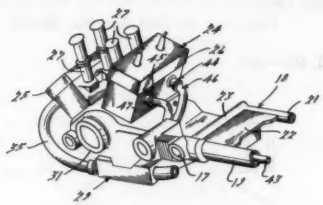
4,522,282

EXHAUST SYSTEM FOR MOTORCYCLE

Hiroshi Yamamoto, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Sep. 27, 1982, Ser. No. 423,559
Int. Cl.³ C60K *13/04;* **F01N** *7/08*
U.S. Cl. 180—219 **15 Claims**

1. In an exhaust system for a motorcycle or the like comprising an engine having an exhaust port, a frame assembly having an element juxtaposed to said exhaust port, and an exhaust device supported at a location spaced from said exhaust port and having an exhaust gas inlet, the improvement comprising an exhaust pipe affixed to said engine in communication with



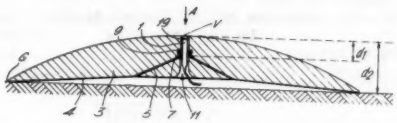
said exhaust port, said exhaust pipe being relatively short in length, and a separately removable connecting pipe extending from the outlet end of said exhaust pipe to said exhaust device exhaust gas inlet.

4,522,283

NOISE MEASUREMENT

Michael J. T. Smith, Newark, England, assignor to Rolls-Royce Limited, London, England

Filed Jun. 4, 1982, Ser. No. 385,264
Claims priority, application United Kingdom, Jun. 17, 1981, 8118642
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—175 **15 Claims**



7. A device for facilitating sound intensity measurements near a sound-reflecting surface, comprising:

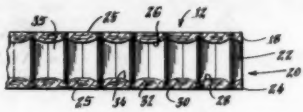
a pad of sound absorbent material having an overall shape which converges from a large basal area to a vertex thereby to provide a gradual change in acoustic impedance from said vertex of said pad to said sound-reflecting surface, at least the perimeter of said large basal area being intended to engage said sound-reflecting surface, and

means for housing a microphone within a hole in said pad such that in use said microphone's sound-sensing portion can be positioned substantially at said vertex, the pad incorporating a plate having a shape which converges from a relatively large basal area to a narrower vertex area, said plate having a basal area and a base-to vertex dimension which are substantially smaller than the corresponding dimensions of said pad, said plate being positioned within said pad so that said vertex area is positioned underneath said sound-sensing portion of said microphone, thereby providing a sound-reflecting surface within said pad which is closer to said sound-sensing portion of said microphone than is said sound-reflecting surface beneath said device when said device is positioned thereon, whereby said plate acts to reduce the intensity of low frequency interference pattern at said microphone caused by reflection of low frequency and sound from said sound-reflecting surface beneath said device.

4,522,284
COMPOSITE PANEL STRUCTURE

William W. Fearon, Worthington, and Arnel M. Macy, Columbus, both of Ohio, assignors to Peabody Noise Control, Inc., Dublin, Ohio

Filed Apr. 20, 1983, Ser. No. 486,944
Int. Cl.³ E04B 1/82
U.S. Cl. 181—292 8 Claims

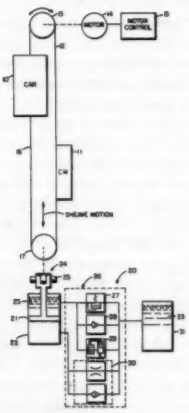


1. A composite panel structure having acoustical absorbing properties, comprising:
a core having structure means forming cells open to at least one side of the core; and
an acoustically semi-transparent facing of fibrous material and a binder formed to provide a relatively hard outer surface of partially bonded fibers with interstices therebetween, the facing being bonded to the structure means at said open side of the core and having portions extending into the adjacent open cells of the core to a depth sufficient to provide a mechanical interlock between the facing and the core to increase the strength of the structure in resisting shear forces adjacent the facing, said portions of the facing being relatively soft and partially filling the adjacent open cells of the core to enhance absorption of acoustic energy directed upon the facing.

4,522,285
HYDRAULIC TIE-DOWN FOR ELEVATORS

John K. Salmon, South Windsor, and Irving A. Hiller, Gales Ferry, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Oct. 20, 1983, Ser. No. 543,703
Int. Cl.³ B22B 11/04
U.S. Cl. 187—22 4 Claims

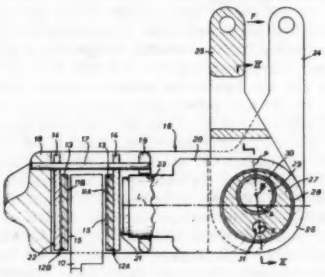


1. An elevator comprising:
a motor drive;
a car;
a counterweight;
a drive rope connecting the car, counterweight, and motor drive for propelling the car and counterweight generally vertically;
a second rope extending from the bottom of the car to the bottom of the counterweight;
a sheave that is located below the car and which guides the second rope as the car and counterweight move;
said elevator characterized in that it includes a hydraulic control for controlling the vertical movement of the sheave that comprises:
a piston connected to the sheave;
a cylinder in which said piston moves vertically within fluid that is contained in the cylinder;
a reservoir for the fluid;
a valve control that controls fluid flow between the cylinder and the reservoir as the piston moves in response to the sheave's movement and comprises first valve means for allowing a maximum fluid flow rate from the cylinder to the reservoir during a piston upstroke and for stopping said flow in response to maximum positive rate of change in the fluid flow from the cylinder to the reservoir during a piston upstroke.

4,522,286
BRAKE CONTROL DEVICE

Gino Villata, Via Moriondo, 24, 14021 Buttigliera d'Asti, and Oreste Becchio, Via San Giuseppe, 1, 12030 Caramagna Piemonte, both of Italy

Filed Apr. 19, 1982, Ser. No. 369,636
Claims priority, application France, Apr. 17, 1981, 81 07811
Int. Cl.³ F16D 55/08
U.S. Cl. 188—72.7 16 Claims



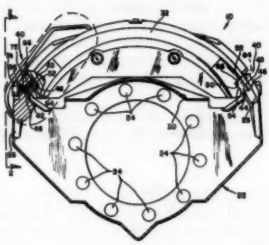
1. A brake control device of the kind operable to apply at least one friction element against a rotatable friction track, comprising a support, a push-rod slidably engaged with said support for movement between an extreme position of rest, and an extreme braking position in which said push-rod applies said at least one friction element against the friction track, a lever connected to the push-rod by cam means, said cam means comprising on the one hand a core fixed to said lever and rotatably mounted on said push-rod and, on the other hand, a cylindrical journal mounted on the support, said core being rotatably mounted about said cylindrical journal and having a cylindrical outer surface which is eccentric relative to said cylindrical journal, said core and said lever consisting of two separate parts which are mounted side by side for conjoint rotation about said journal, and assembly means by which said core and lever are fixed to each other.

4,522,287

DISC BRAKE WITH CAMMING MEMBER AND TORSION SPRING FOR VIBRATION CONTROL

Kurt R. Heidmann; Jon S. Canale, and Hans Burkhardt, all of Elyria, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed May 7, 1982, Ser. No. 375,925
Int. Cl.³ F16D 65/02
U.S. Cl. 188—73.35 10 Claims



1. Disc brake assembly comprising a rotor mounted for rotation with a member to be braked, said rotor having a pair of friction faces, a pair of friction elements disposed adjacent said friction faces, a caliper for urging said friction elements into braking engagement with said friction faces, a support member for said caliper, and means for slidably mounting said caliper on said support member, said slidably mounting means including a camming member carried by said support member and slidably engaged by said caliper, and means for yieldably rotating said camming member, said rotating means including a torsion spring engaging said camming member and yieldably biasing the latter in a predetermined rotative direction, said torsion spring including a loop, one end of said loop terminating in a first connecting portion for securing said loop to said camming member, the other end of said loop terminating in a second connecting portion engaging said caliper to thereby stress said loop to cause the latter to provide a yieldable rotating force through said first connecting portion to said camming member.

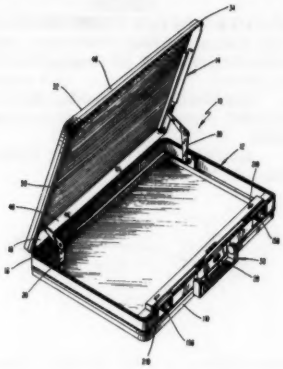
4,522,288

LUGGAGE

John A. Wickman, Swansea, Mass.; John J. Killion, III, Warren, R.I., and Charles Deschenes, North Attleboro, Mass., assignors to American Tourister, Inc., Warren, R.I.

Filed Nov. 7, 1983, Ser. No. 549,552
Int. Cl.³ A45C 5/10
U.S. Cl. 190—106 4 Claims

1. In a container of the type comprising a box member, a lid member hinged thereto, and at least one stay assembly interconnecting said members to retain said lid member in an open position, the improvement wherein said stay assembly comprises first and second links interconnected at mutually adjoining ends for rotation about an axis, another end of said first link being rotatably connected to one of said members, and another end of said second link being rotatably connected to the other of said members, said links being relatively rotatable about said axis between lid-open and lid-closed positions, a resiliently flexible non-metallic washer interposed between said adjoining ends of said links such that said axis passes through said washer, said washer being disc-shaped and including a generally planar first side bearing against said adjoining end of said first link and a second, opposite side facing said adjoining end of said second link, means preventing relative rotation between said washer and said first link, while relative rotation between said washer and said second link is permitted, said first side of said washer including at least one recess which renders an overlying section of said second surface to be resiliently flexible away from the plane of said adjoining end of said second link, a shoulder formed on said section of said second surface and projecting toward said second link, a projection disposed on said adjoining end of said second link and directed toward said washer so as to flex said resiliently flexible section away from said plane and into said recess in response to relative



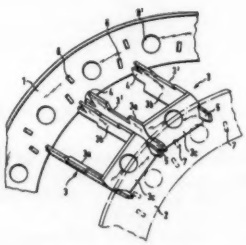
rotation between said lid and box members to a lid-open position until said projection travels beyond said shoulder enabling the latter to rebound toward said plane, whereby said shoulder yieldably resists reverse travel of said projection.

4,522,289

RETAINER RING FOR A FREEWHEEL CLUTCH

Emil Giese; Ruprecht Maurer, both of Bad Homburg, and Max Hagen, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Ringspann Albrecht Maurer K.G., Bad Homburg, Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,043
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151727
Int. Cl.³ F16D 41/07
U.S. Cl. 192—41 A 11 Claims



1. A retainer ring for a freewheel clutch, comprising:

(a) an annular disc having an axis and two opposite faces perpendicular to said axis; and

(b) a plurality of separate, mutually independent sprag-guiding clips mounted on one of said faces of said annular disc in a circumferential distribution about said axis; each clip extending parallel to said axis and defining a cage for holding captive by itself, at least in a radial direction, a sprag having a circumferential surface and opposite end faces; each clip comprising

(1) two parallel, circumferentially spaced legs extending from said one face and being parallel to said axis; said legs bounding said cage and extending along opposite sides of the circumferential surface of the sprag; and

(2) a web interconnecting said two legs at ends thereof

remote from said one face of said annular disc; said web bounding said cage and extending along one of the end faces of the respective sprag.

4,522,290

FRICTIONAL LINING FOR A WET CLUTCH OR BRAKE

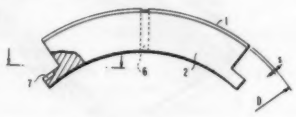
Rainer Klink, Kernen, Fed. Rep. of Germany, assignor to Deutsche Automobilgesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,126

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3145999

Int. Cl.³ F16D *13/62, 13/72, 43/18*

U.S. Cl. 192—107 M 8 Claims



1. A frictional lining for a wet clutch or brake comprising a resin-free wood with an average raw density in dried condition (δ_0) of at least about 550 kilograms per cubic meter, the fibers of the resin-free wood running substantially parallel to the frictional direction of the clutch or brake.

4,522,291

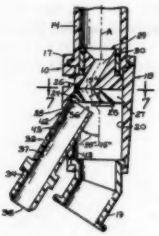
SEED FLOW DIVIDER ATTACHMENT FOR SEED DRILLS

D. Neal Smick, Box 158, Connell, Wash. 99326

Filed Jun. 27, 1983, Ser. No. 508,027

Int. Cl.³ B65G *11/00*

U.S. Cl. 193—23 20 Claims



1. A seed flow divider attachment for a seed drill having a primary seed delivery tube for receiving seed from a seed hopper and guiding the seed along a primary flow path to a discharge, the attachment comprising:

a hollow insert having a central open bore extending between open ends, mountable to the seed drill such that the seeds flowing along the primary flow path will pass through the open central bore;

deflector means within the hollow insert for angularly deflecting seed passing through the hollow insert through a prescribed angle of deflection;

seed interceptor means mounted to the hollow insert adjacent the deflector means to intercept a prescribed percentage of seed deflected by the deflector means and direct the intercepted seed to a secondary flow path divergent from the primary seed flow path;

wherein the seed interceptor means includes a tube for receiving and guiding interceptor seed from the primary flow; and

adjusting means for selectively positioning the tube within the hollow insert to correspondingly vary the amount of seed intercepted thereby and directed to the secondary flow path.

4,522,292

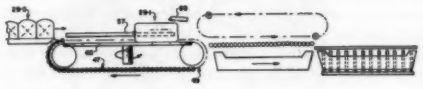
PATTERN FORMING APPARATUS AND PRODUCT ORIENTER THEREFOR

Maynard R. Euverard, Williamsburg, Va.; James J. Diver, South Holland, and Thomas C. Schneider, Oak Forest, both of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.

Filed Jan. 12, 1983, Ser. No. 457,431

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—374 35 Claims



1. Product orienting apparatus comprising means for conveying product in a generally longitudinal path of travel, and support means disposed in said path, said support means including reorienting means defining a fixed reorienting plane and movable for reorienting said product in said plane with respect to said path, said support means including transfer means continuously movable parallel to said reorienting plane for receiving said product from said conveying means along said path and supportively carrying said product to a position overlying said reorienting means and depositing the product thereon and discharging the reoriented product along said path.

4,522,293

DEVICE FOR TRANSFERRING EGGS FROM A FEEDING CHAIN TO RETAINING MEMBERS MOVING BEHIND EACH OTHER

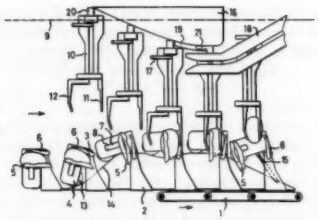
Hendrik J. van Kattenbroek, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Dec. 21, 1981, Ser. No. 332,597

Claims priority, application Netherlands, Jan. 9, 1981, 8100085

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—377 9 Claims



1. Device for transferring eggs from a source of eggs in which the egg axes are horizontal, said device comprising

an endless conveying means for conveying in a vertical plane;

first retaining members mounted on said conveying means for receiving and gripping an egg which axis is horizontal, each of said first retaining members comprising a plurality of gripping fingers, at least one of which is movable with respect to at least another gripping finger, and means for rotating the egg into a position in which the egg axis is vertical;

a conveyor;

a plurality of second retaining members mounted on said conveyor and comprising a plurality of gripping fingers,

at least one of which is movable with respect to at least another gripping finger, said conveyor moving said second retaining members along a predetermined path in a line, one behind the other, said path being such that corresponding ones of said first and second retaining members are located vertically above one another in a predetermined region of said path and move in the same direction;

means for controlling said movable fingers of said first and second retaining members when in said region;

means coordinated with said controlling means for rotating each of said first retaining members in a parallel direction to the direction of movement when in said region such that when said parallel rotation occurs, said first retaining member movable finger is moved away from said another gripping finger and said second retaining member movable finger is moved toward said another gripper finger; and

means for vertically moving said first and second retaining members relative to each other when in said region.

4,522,294

METHOD AND APPARATUS FOR GROUPING ITEMS

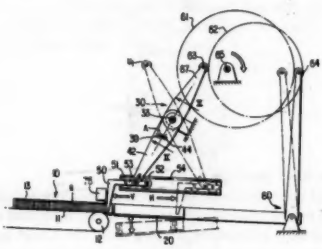
Theo Walz, Neunkirch, Switzerland, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jan. 21, 1983, Ser. No. 460,050

Claims priority, application Switzerland, Jan. 21, 1982, 381/82

Int. Cl.³ B65G *25/00, 47/26*

U.S. Cl. 198—429 **5 Claims**



1. An apparatus for grouping items comprising

(a) a supply conveyor for advancing items in an edgewise supported, upright oriented face-to-face series; said supply conveyor having a discharge end;

(b) a receiving trough adjoining said discharge end of said supply conveyor for receiving items from said supply conveyor; said receiving trough having a length;

(c) a collector slide arranged for movement on said receiving trough along the length thereof for controlling the admission of items from said supply conveyor to said receiving trough;

(d) a drive mechanism for moving said collector slide;

(e) a lever system connecting said drive mechanism with said collector slide; said lever system including electromagnetic clutch means for operatively coupling said collector slide to or disconnecting said collector slide from said drive mechanism; and

(f) a control system operatively connected with said electromagnetic clutch means; said control system including

(1) switch means connected to said electromagnetic clutch means;

(2) item counting means for counting items on said receiving trough and generating a counting signal, said counting means being connected to said switch means for applying to said switch means said counting signals; and

(3) length sensing means generating length signals representing the length of path travelled by said collector slide on said receiving trough; said length sensing means being connected to said switch means for applying to said switch means said length signals; said switch means controlling said electromagnetic clutch means as a function of said counting signals and said length signals.

4,522,295

DEVICE FOR DIVIDING A STREAM OF LOOSE MATERIAL

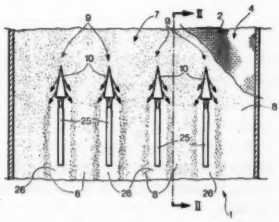
Enzo Seragnoli, Bologna, Italy, assignor to G.D Società per Azioni, Bologna, Italy

Filed Oct. 24, 1983, Ser. No. 545,004

Claims priority, application Italy, Nov. 17, 1982, 3593 A/82

Int. Cl.³ B65G *47/22*

U.S. Cl. 198—493 **5 Claims**



1. Device (7) for dividing a stream of loose material into at least two secondary streams, said loose material consisting of a layer (5) of said material fed in a given direction (6) on the conveying surface (4) of a conveying device (1), said secondary streams consisting of strips (8) of said material parallel to each other and to the direction of feed (6) and arranged so as to contact said conveying surface (4); the dividing device (7) comprising means (19) for supplying fluid under pressure to each adjacent pair of the said strips (8), at least one pair of nozzles (20, 21) for supplying the said fluid under pressure; the nozzles (20, 21) of each said pair being arranged facing the said conveying surface (4), at a greater distance from it than the thickness of the said layer (5), at an angle to the said conveying surface (4), in the same direction as the said direction of feed (6) and essentially symmetrical with it; the speed at which the said fluid under pressure comes out of the said nozzles (20, 21) parallel to the said direction of feed (6) being greater than the speed at which the said conveying surface (4) is travelling.

4,522,296

FLAIL AUGER FOR SEMI-LIQUID MANURE SPREADER

David M. Rieke, Celina, Ohio, assignor to The Paul Revere Corporation, Coldwater, Ohio

Continuation-in-part of Ser. No. 372,423, Apr. 27, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 580,936

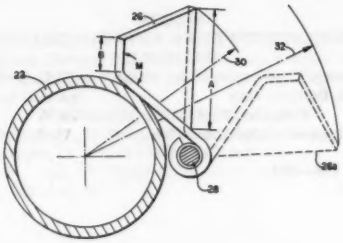
Int. Cl.³ B65G *33/30*

U.S. Cl. 198—548 **8 Claims**

1. A flail auger assembly for a material unloader having a holding tank with a shaft rotatably mounted and extending through the lower portion of the holding tank, one end of the shaft penetrating an aperture in a wall of the holding tank through which material is removed, there also being means for rotating the shaft associated with the holding tank; and

a plurality of flails mounted at spaced intervals along the length of the shaft, each of said flails being independently secured thereto by a pivot for permitting lateral rotation of said flails relative to said shaft so that the flails can assume a compressed position with a small radius of effectiveness adjacent to the shaft or an extended position with a large radius of effectiveness in response to the resistive qualities of the material in said holding tank and the centrifugal forces imparted to said flails by the rotating shaft,

said flails being oriented with respect to the shaft to cooperate with the holding tank to impart both stirring of the material within the holding tank and a lateral component



of thrust on said material by one flail to the next flail along the shaft for moving material out through the aperture in the wall.

4,522,297

TRANSPORTER FOR HEAVY LOADS

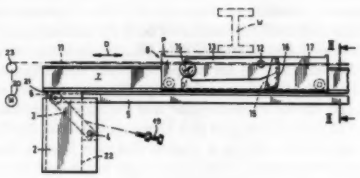
Leopold Jaegers, Rudolf-Diesel-Str. 1, D-5350 Euskirchen, Fed. Rep. of Germany

Filed Jan. 7, 1983, Ser. No. 456,384

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200495

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—774 **18 Claims**



1. A heavy-load transport apparatus comprising:

a stationary support beam extending horizontally in a transport direction and adapted to support an elongated heavy load with same lying on the support beam and extending horizontally transversely thereto;

a guide beam extending in the direction generally parallel to the support beam;

a carriage riding on the guide beam and displaceable in the direction therealong;

lifting means connected to the guide beam for vertically displacing same between an upper position with the carriage at least partly above the support beam and a lower position with the carriage below the support beam, whereby when the carriage underlies the load and is raised from the lower to the upper position it raises the load off the support beam;

drive means including a flexible drive element having a generally straight stretch extending parallel to the direction adjacent the guide beam for displacing the carriage along the guide beam;

a pivot on the carriage defining a horizontal pivot axis generally perpendicular to the direction;

a rigid connection arm extending generally horizontal and parallel to the direction between the carriage and the stretch, the arm having an inner end connected to the carriage at the pivot for angular displacement of the arm about the axis and an outer end connected to the stretch, whereby as the carriage is raised and lowered the outer end pivots down and up substantially without vertically deflecting the stretch; and

a pocket-forming vertical guide slot fixed on the carriage and receiving the outer end of the arm, the slot forming for the arm a stop engageable upward against the outer end only in the upper position of the carriage, whereby force can be transmitted directly by the stop between the outer arm end and the carriage in the upper carriage position.

4,522,298

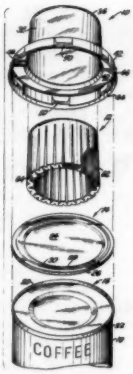
COFFEE FILTER PACKAGE ARRANGEMENT

Royal Weinberger, Clifton, N.J., assignor to North American Systems, Inc., Bedford Heights, Ohio

Filed Jul. 2, 1984, Ser. No. 627,049

Int. Cl.³ B65D *79/00, 21/00, 85/62*

U.S. Cl. 206—216 **12 Claims**



1. A coffee filter package comprising:

a cylindrical upper receptacle portion for receiving a supply of nested coffee filters and retaining them in pleated form;

a peripheral skirt portion depending from the lower end of the receptacle portion for snapping onto the lid of a coffee can, and

inwardly directed resilient locking tabs for removably securing the filter package onto the coffee lid, whereby said package with filters can be commercially distributed on the top of a coffee can and subsequently utilized by a consumer for filter dispensing.

4,522,299

RIGID POLYETHYLENE CARRY GOLF BAG WITH STAND

George W. Clark, and Christopher B. Keene, both of Orono, Canada, assignors to 434743 Ontario Inc., Orono, Canada

Filed Jan. 23, 1984, Ser. No. 573,291

Int. Cl.³ A63B *55/00;* **B62B** *1/04*

U.S. Cl. 206—315.3 **5 Claims**

1. A golf club bag comprising:

an integral one-piece tubular outer shell, having a closed bottom end, and an open upper end;

a top panel closing said open upper end of said tubular shell, and having a plurality of shaft apertures therein;

a core defining guide channels forming handle recesses for reception of club handles therein fastened within said shell and extending from said upper end of said shell downwardly and terminating short of the closed end of said shell;

stops at the lower end of said channels for supporting the ends of club handles;

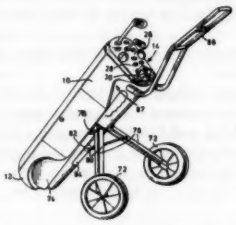
handle means on the exterior of said tubular shell;

releasable closure means for said upper end of said tubular shell

dimensioned and shaped to cover the heads of clubs located in said tubular shell;

a pair of movable legs swingably mounted on said outer shell;

spring means normally biassing said legs into a closed position;



linkage means extending between said handle means and said legs whereby said legs may be moved against said spring, into an extended position;

struts linked at one end to said legs, and,

slide means, and a guide for said slide means on said shell, said struts being connected at their other ends to said slide means.

4,522,300

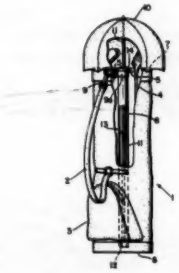
CLUB PROTECTIVE DEVICES FOR GOLF BAGS

Newman Hamblet, 11807 Sussex Square Dr., Richmond, Va. 23223

Filed Sep. 13, 1983, Ser. No. 531,617

Int. Cl.³ A63B *55/00*; A45B *11/00*; A47G *25/12*

U.S. Cl. 206—315.4 **20 Claims**



1. In combination, a golf club container for use by an individual in transporting golf clubs, a protective device having a protective head dimensioned and configured such that the head can protect an open upper end of the club container and club contents thereof when situated adjacent and above said upper end, said protective device having a shaft extending downwardly beyond the open upper end of the club container, support means carried by said club container for receiving said shaft so as to permit raising and lowering of said shaft and protective head relative to the club container, said support means including limit means for defining a lower support position for said shaft such that the protective head will lie above and closely adjacent the upper end of the club container and any club contents therein, said shaft being dimensioned such that the protective head together with the shaft can be raised sufficiently to permit full removal of a club from the upper end of the club container while part of the shaft remains in said support means, whereby said shaft and protective head can be freely moved between said lower support position for container and club protection and a raised position for club removal without separating said shaft and support means.

4,522,301

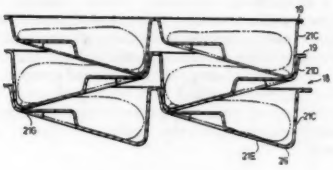
TRAY

Shreyas H. Ajmera, Downsview, Canada, assignor to Baker's Bakery Ltd., Downsview, Canada

Filed Jun. 15, 1984, Ser. No. 621,257

Int. Cl.³ B65D *21/04*

U.S. Cl. 206—507 **4 Claims**



1. An improved tray carrying a plurality of spaced apart recesses, suitable for carrying a plurality of forms of raw croissant dough, of a design and configuration permitting a plurality of such trays to be stacked one on the other without deforming the forms of raw croissant dough carried in such recesses is provided, the improvement comprising a specially configured tray carrying a plurality of similarly spaced apart cavities, each cavity having a mouth substantially coplanar with the plane of the top of the tray, an inclined base to carry the fatter portion of the croissant in the deeper portion of the base, a peripheral wall defining the vertical space between the mouth and the inclined base of each cavity, and a raised portion raised from the shallower portion of the inclined base and extending from the peripheral wall, of suitable dimensions such that normally a croissant resting within a cavity reaches not higher than the plane of the mouth of the cavity and not higher than the plane of the raised portion raised from the inclined base, and, each cavity presents an inclined protuberance on the underside of the tray whereby at least two trays stacked one on the other may be oriented 180 degrees with respect to each other so as to align the deeper portion of each protuberance to rest upon the raised portion raised from the inclined base of a cavity of an underlying tray.

4,522,302

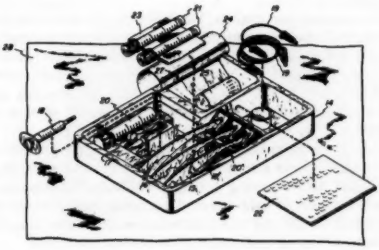
PRE-STERILIZED MEDICAL PROCEDURE KIT PACKAGES

Myron Paikoff, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,362

Int. Cl.³ B65D *1/34, 77/04, 83/04*

U.S. Cl. 206—570 **5 Claims**



1. A medical procedure package comprising in combination:

A. a sealed, pre-sterilized outer package wrap containing therein:

B. an essentially unitary, two-compartment kit wrapped

within an inner package wrap, said kit containing in the first of said compartments:

(a) a medical procedure set-up tray and associated essential medical procedure components, said outer package wrap, set-up tray, essential medical procedure components and inner package wrap being compatible with ethylene oxide sterilization, and in the second of said compartments:

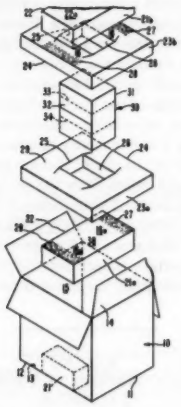
(b) a medicament containing rubber closured vial contained within a sealed ethylene oxide impermeable container, said sealed container being also compatible with ethylene oxide sterilization, said vial and said container prior to sealing being sterilized by, and compatible with, heat sterilization, and said outer and inner package wraps, set-up tray, medical procedure components and vial-containing container being sterilized by ethylene oxide.

4,522,303

PAYLOAD-PROTECTING SHIPPING CONTAINER

James A. Starr, San Jose, Calif., assignor to Atasi Corporation, San Jose, Calif.

Filed Dec. 22, 1983, Ser. No. 564,814
Int. Cl.³ B65D *85/38*
U.S. Cl. 206—588 **16 Claims**



1. In a shipping container for protection of a payload from shock loading comprising:

an outer rectangular box having at least one open but closable end;

a rectangular resilient bottom cap abutting a closed end of said outer box;

a first rectangular resilient block abuttingly mounted on said cap and having a central aperture to support one end of an inserted payload, said first block having a height sufficient to support said one end of an inserted payload, and said first block having length and width dimensions corresponding to the internal length and width of said outer box;

a second rectangular resilient block having a central aperture to support a second end of said inserted payload, said second block having a height sufficient to support said second end of said inserted payload, said second block having length and width dimensions corresponding to the internal length and width of said outer box; and

a rectangular resilient top cap abutting a top surface of said second block and having a top surface in a plane corresponding to the closable end of the outer box in closed position, the improvement comprising:

means for adhering only selected edge portions outwardly spaced from said central apertures in each of said blocks to corresponding portions of the bottom and top caps abutting each of said blocks leaving unadhered portions for stress relieving said blocks upon imposition of a force.

10. In a shipping container for protection of a payload from shock loading comprising:

an outer rectangular box having at least one open but closable end;

a rectangular resilient bottom cap abutting a closed end of said outer box;

a first rectangular resilient block abuttingly mounted on said cap and having a central aperture to support one end of an inserted payload, said first block having a height sufficient to support said one end of an inserted payload, and said first block having length and width dimensions corresponding to the internal length and width of said outer box;

a second rectangular resilient block having a central aperture to support a second end of said inserted payload, said second block having a height sufficient to support said second end of said inserted payload, said second block having length and width dimensions corresponding to the internal length and width of said outer box; and

a rectangular resilient top cap abutting a top surface of said second block and having a top surface in a plane corresponding to the closable end of the outer box in closed position, the improvement comprising:

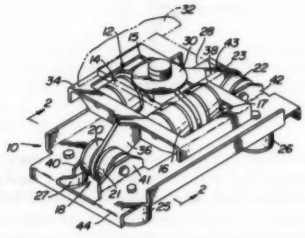
means for forming slits in said first and second blocks extending into said blocks at an angle from each of the corners of said apertures for stress relieving said blocks upon the imposition of a force, where said stress relieving occurs near the corners of said apertures as the sides of said slits are forced to separate.

4,522,304

SHOCK MOUNT APPARATUS

Walter C. Dean, II, Collegeville, Pa., assignor to The Budd Company, Troy, Mich.

Filed Apr. 19, 1982, Ser. No. 369,652
Int. Cl.³ F16F *15/00*; B65D *81/08*
U.S. Cl. 206—591 **4 Claims**



1. A shock mount assembly directly connected between a component to be transported and a structural body comprising:

(a) a mounting plate connecting said component to said shock mount assembly;

(b) attachment elements connecting said shock mount assembly to said structural body;

(c) said shock mount assembly including first, second and third elastomeric shock members;

(d) a first frame member spaced below said mounting plate;

(e) said mounting plate having downward extending portions;

(f) said first elastomeric shock member being connected between said downward extending portions of said mounting plate and said first frame member;

(g) a second frame member spaced below said first member;

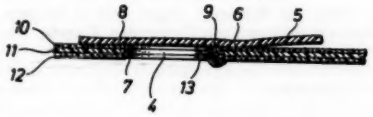
(h) said first frame member having downward extending portions;
(i) said second elastomeric shock member being connected between said first and second frame members;
(j) said downward extending portions of said mounting plate and said first frame member being at right angles to each other;
(k) said third elastomeric shock member extending downward from said second frame and connected to said structural body;
(l) said first, second and third elastomeric shock members being connected to their respective frames in three different planes and each of said shock members being at right angles with respect to each other; and
(m) said first, second and third elastomeric shock members all having the same operating characteristics and further being disposed so that one elastomeric member is primarily in compression and the other two elastomeric members are primarily in shear.

4,522,305

OPENING ARRANGEMENT FOR PACKING CONTAINERS WITH PRESSURIZED CONTENTS

Kenth Jacobsson, Södra Sandby, Sweden, assignor to Tetra Pak Developpement SA, Pully, Switzerland

Filed Aug. 23, 1982, Ser. No. 410,714
Claims priority, application Sweden, Aug. 28, 1981, 8105092
Int. Cl.³ B65D *37/00*
U.S. Cl. 206—632 **1 Claim**



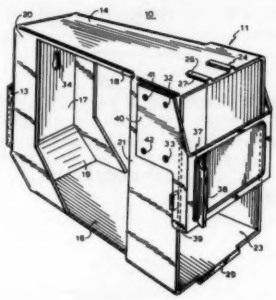
1. An opening arrangement for a laminated packing container, comprising:
a laminated packing container wall having three layers of thermoplastic material and a pouring opening provided therethrough;
a cover strip sealed in a liquid-tight manner to an outer layer of said laminate, said cover strip having a non-sealed part for facilitating removal of said cover strip;
a sealing zone between said cover strip and said outer layer completely surrounding and being spaced from an edge of the pouring opening to avoid rupturing said edge upon opening said container, said sealing zone having a point directed toward said non-sealed part of said cover strip;
a countersunk area defining a pouring edge and comprising a long narrow recess extending along a portion of the pouring opening, said pouring edge being bent in an outwardly direction and extending at an angle to the container wall to guide said contents away from said laminate but remaining completely inside a plane defined by said outer layer of said laminate so as not to interfere with said cover strip; and
the seal in the sealing zone between the cover strip and the outer layer being stronger than a bond between the outer thermoplastic layer and the central thermoplastic layer such that removal of said cover strip also delaminates said outer layer from said laminate, said delamination being initially concentrated at said point of said sealing zone.

4,522,306

RACK MODULE

William Silver, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.

Filed Mar. 2, 1983, Ser. No. 471,231
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—49.1 **11 Claims**



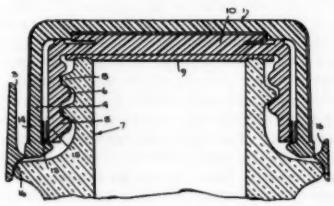
1. A rack module comprising a body member including vertically spaced parallel horizontal top and bottom walls, a vertical rear wall depending from the rear edge of said top wall and vertical side panels extending between corresponding forward side edges of said top and bottom walls and having front edges delineating with the front edges of said top and bottom walls an access opening to said module extending for substantially the full height and width of said module, complementary coupling members located on the outside faces of said top and bottom walls respectively, a visor member including a face plate, means coupling said visor member to said body member for swinging about a transverse axis between an open position with said face plate located above said top wall thereby providing full front access to said body member access opening and a closed position with said face plate being in registry with said access opening and having a lower edge disposed above the level of the bottom of said access opening to delineate with said bottom wall front edge an article dispensing opening and means for mounting said module to a support member.

4,522,307

CHILD-RESISTANT TAMPER-EVIDENT CLOSURE

Gerald E. Steiner, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Oct. 19, 1983, Ser. No. 543,334
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—219 **4 Claims**



1. A tamper-indicating child resistant closure for a container having closure engaging members on its neck comprising the combination of:
a cup-like outer shell with a cover and a depending skirt;
a cup-like inner shell;

thread-like means on said inner shell for engaging said closure engaging members,

ratchet means for coupling said shells only while being turned onto the container;

normally spaced friction means on the lower edges of said shells facing radially outwardly on the inner shell and radially inwardly on the outer shell for releaseably engaging said shells for cap removal; and

removable means for releaseably holding said friction means disengaged.

4,522,308

MANUALLY MOUNTABLE TAMPER EVIDENT ORAL LIQUID DOSE VIRAL AND SEAL ASSEMBLY

James J. Sullivan, 1329 N. Foothill Rd., Ojai, Calif. 93023

Filed Jan. 18, 1984, Ser. No. 572,154

Int. Cl.³ B65D *41/62*

U.S. Cl. 215—253 **5 Claims**

1. A tamper evident and substantially leak-proof oral liquid dose vial and seal assembly having a substantially cylindrical vial of approximately 5 to 100 mililiters in volume, and a seal adapted for one-time sealing of the vial and to be substantially destroyed when removed from said vial, the assembly comprising:

a first lip disposed on the circular outer circumference of the vial substantially adjacent to the mouth of the vial;

a base plate of the seal disposed on the top of the vial to cover the mouth;

a substantially circular sealing rib disposed at substantially right angle to the base plate and projecting inwardly into the interior of the vial in sealing engagement with interior walls of the vial;

a lip of the seal attached to the base plate of the seal and projecting downwardly from the base plate around the circumference of the base plate;

a plurality of ribs projecting inwardly from the lip of the seal below the rib of the vial and in engagement therewith;

a first frangible portion of the seal comprising a first narrow continuous strip of thin walled material which extends approximately one eighth to one third around the circumference of the base plate between the base plate and the lip of the seal, and which further extends into the lip of the seal from the base plate to the lower end of said lip;

a second frangible portion of the seal comprising a second narrow continuous strip of thin walled material which extends approximately one eighth to one third around the circumference of the base plate between the base plate and the lip of the seal, and which further extends into the lip of the seal from the base plate to the lower end of said lip, a portion of the lip of the seal being disposed between the first and second frangible portions of the seal, and

a tab, adapted to be gripped and pulled by an operator, attached to the portion of the lip of the seal which is disposed between the first and second frangible portions whereby upward pulling of the tab breaks the frangible portions, disengages at least one rib of the lip of the seal from the lip of the vial and removes the seal from the vial.

4,522,309

CATHODE-RAY TUBE

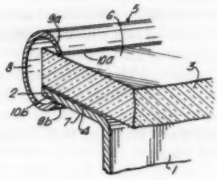
Colin D. Overall, Reigate, and Leslie H. Francis, Horley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,589

Claims priority, application United Kingdom, Jan. 7, 1983, 8300351

Int. Cl.³ H01J *29/86*

U.S. Cl. 220—2.1 A **6 Claims**



1. A cathode ray tube envelope comprising a metal rear housing having a flange, a glass faceplate secured to the flange to close the envelope, a pressure-bonded seal disposed between the faceplate and the flange, and means for clamping the faceplate to the flange,

said clamping means comprising a plurality of resilient channel-shaped spring clamps arranged around the faceplate-flange periphery, each spring clamp having converging side walls which, at the portions nearest each other, engage respective outer surfaces of the faceplate and the flange, thereby maintaining compression of said seal.

4,522,310

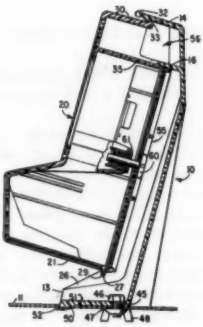
HOUSING HOLDER AND COOPERATING DETACHABLE HOUSING

Frank Mikic, and William T. Pagac, both of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Mar. 15, 1982, Ser. No. 358,356

Int. Cl.³ F16M *13/00*

U.S. Cl. 220—4 R **2 Claims**



1. A housing holder and cooperating detachable housing, comprising an elongated holder adapted to be mounted on a support, said holder including an integral rigid foot portion and an integral resilient head portion generally aligned with and spaced from said foot portion, a cooperating detachable housing sized to be accommodated between and engaged by said foot and head portions of said holder, cooperating interlocking means on said rigid foot portion and said housing, cooperating interlocking means on said resilient head portion and said housing, whereby flexing of said resilient head portion readily establishes and releases interlocking relation of said

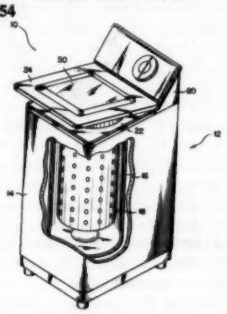
respective cooperating interlocking means and thus the attachment and detachment of said holder and said housing, an integral rigid shelf portion on said holder spaced below said head portion, a cooperating rigid partition on said housing located to underlie said shelf portion when said housing is attached to said foot and head portions, and a removable rear panel closing that portion of the open rear of said housing between said rigid partition and the housing bottom, the unclosed portion of the housing rear between said partition and the housing top providing an access opening enabling the housing top to serve as a self-contained handle for said housing.

4,522,311

LID WITH A SEE-THROUGH PLATE

Yoshio Ikeda, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 10, 1983, Ser. No. 456,849
Claims priority, application Japan, Feb. 8, 1982, 57-19405
Int. Cl.³ B65D *51/18*
U.S. Cl. 220—254 **12 Claims**



1. A lid to close an access port of an apparatus comprising:

a lid body defining an opening to permit visual inspection of the interior of the apparatus, said lid body including (a) a recessed engaging groove defined around the periphery of said opening, (b) first engaging means disposed in said engaging groove, and (c) hinge means for connection to said apparatus to permit said lid body to pivotally move between open and closed positions to respectively open and close the access port;

a removable transparent member sized and configured to cover said opening and including second engaging means for engaging said first engaging means to thereby couple said transparent member to said lid body in response to said transparent member being moved into an engaged position and for disengaging said first engaging means to thereby permit removal of said transparent member in response to said transparent member being moved to a disengaged position; and

holding means defining an aperture and removably mounted to said lid body so that said aperture is in registry with said transparent member and so that said holding means covers said engaging groove for holding said transparent member in said engaged position; wherein

said lid body further includes plural retaining members disposed in said engaging groove each defining a flange; and wherein

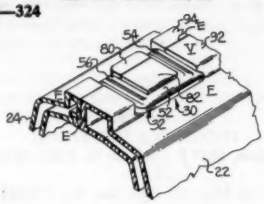
said holding means includes plural elastic pawl means each defining an engaging surface, each said pawl means elastically engaging a respective flange of said retaining members to removably hold said transparent member in said engaged position with said lid body whereby upon removal of said holding means, movement of said transparent member to said disengaged position is permitted to thereby allow removal of said transparent member from said lid body.

4,522,312

CONTAINER AND ASSOCIATED LATCH STRUCTURE

Juergen Rathgeber, Raleigh, and William W. Ward, Clayton, both of N.C., assignors to Southern Case, Inc., Raleigh, N.C.

Filed Sep. 14, 1983, Ser. No. 532,226
Int. Cl.³ B65D *45/16*
U.S. Cl. 220—324 **12 Claims**



1. In a container having base and cover parts that are movable between open and closed positions and define respective confronting edges that abut each other when the container is in the closed position, a latch assembly comprising:

a buckle comprising spaced apart attachment and latching portions and a body portion joining the attachment and latching portions, said attachment portion including rod means defining a central rod segment and a pair of outwardly extending end rod segments;

rod receiving undercuts formed on one of said container parts adjacent the confronting edge thereof, said undercuts including a central undercut for receiving said buckle central rod segment and a pair of end undercuts for receiving respective ones of said buckle end rod segments, said undercuts forming a journal for pivoting of the buckle to a latch securement position where the buckle body portion bridges the abutting confronting edges; and

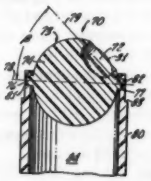
cooperative means on the latching portion of the buckle and the other container part for releaseably securing the buckle to the other part when the buckle is in the mentioned latch securement position.

4,522,313

ARTICLE DISPENSER

Paul D. Jennings, 1039 E. Almond Ave., Orange, Calif. 92666, and Kenneth L. Jennings, Rte. 2, P.O. Box 83-4, Strafford, Mo. 65757

Filed Sep. 13, 1983, Ser. No. 531,684
Int. Cl.³ B65D *83/04*
U.S. Cl. 221—1 **22 Claims**



20. A method of dispensing an article from a storing vessel equipped with a pivotally suspended sphere having a hemisphere with a cavity in proximity of the pivotal suspension, characterized by the steps of:

(a) inverting the dispenser thereby causing the hemisphere to be positioned facing the internal confines of the vessel;

(b) transferring the article from the vessel to the surface of

the hemisphere, said article sliding along the spherical contour of the hemisphere into the cavity; and

(c) restoring the dispenser to its initial position prior to execution of step (a) thereby causing the hemisphere with the cavity bearing the article to be positioned external to the inner confines of the vessel.

21. A dispenser incorporating a vessel capable of storing at least one article, characterized by:

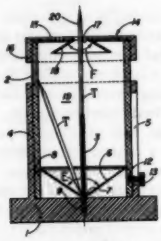
a ball structure having a curved contour and being pivotally coupled at two locations to said vessel for rotation about one axis, said contour having a cavity therein that is nearer to one of said two locations than to the other of said two locations.

4,522,314

TOOTHPICK DISPENSER

Alexander Nelson, 1027 E. Pleasant St. #303, Milwaukee, Wis. 53202

Filed Mar. 17, 1983, Ser. No. 476,055
Int. Cl.³ A24F *15/04*
U.S. Cl. 221—190 **5 Claims**



1. A toothpick dispenser for dispensing a toothpick in a vertical position, comprising:

a stationary base having an upright cylindrical housing that defines a longitudinal axis, said base includes a closed bore formed therein along said axis;

a cylindrical body having an open top and a closed bottom for containing a plurality of toothpicks longitudinally on their ends in substantially vertical positions, said body telescopically received within said housing for vertical axial sliding movement therein between an upper loading position and a lower dispensing position,

an upstanding support member projecting axially from said base within said housing for receiving a single toothpick on its end in an upright vertical position when said housing is moved to its loading position, said support member includes an axially extending cone-shaped opening in the free end thereof dimensioned to substantially correspond to the dimensions of a tapered end of a toothpick, said free end of said support member being split axially to provide a pair of resilient fingers to permit axial movement of a toothpick therein upon the application of a longitudinally directed force on a toothpick, and having its lower end slidably frictionally engaged in a press fit manner within said closed bore to permit adjustment of the height of the free end of said support member;

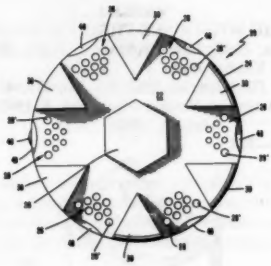
said closed bottom sloping inwardly and downwardly toward a central opening formed therein, said central opening dimensioned to slidably receive said support member so that when said body is moved upwardly to its loading position the lower end of a single toothpick passes through said central opening and is received by said support member and when said body is moved downwardly to its dispensing position said support member closes said opening and said toothpick projects axially from said body.

4,522,315

CLOSURE CAP FOR MULTI-COMPARTMENT CONTAINERS

Karl G. Rapp, Iserlohn, Fed. Rep. of Germany, assignor to United Industries Sales Organization, Inc., North Miami, Fla.

Filed Feb. 22, 1982, Ser. No. 350,568
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 8133868[U]
Int. Cl.³ A47G *19/24*
U.S. Cl. 222—142.1 **12 Claims**



1. A dispensing closure cap for a container having a plurality of compartments communicating with an open mouth of said container, said cap comprising:

a body mountable on the container in sealing engagement therewith for closing the container mouth;

a top wall defined by said body including a central raised hub and at least one dispensing opening for each of the container compartments;

a non-rotatable lid assembly mounted on said cap body comprising a lid for each at least one dispensing opening pivotably connected to a central mounting means comprising a polygonal ring-shaped member; and,

a corresponding polygonal configuration provided on said hub so that said mounting member is mounted on said hub in a mating relationship, said mounting member provided as a flexible member and said hub is provided with side walls which taper inwardly from top to bottom such that said mounting member is releasably mounted on said hub in a snap-fit relationship therewith;

said lid assembly is provided as an integral one-piece unit made of plastic with each lid spaced from said mounting member and connected thereto by flexible hinge means, each hinge means comprises a leg member connecting the corresponding lid and said mounting member and including a pivot joint defined at a junction between the corresponding leg member and lid and formed by a V-shaped crimp in the junction;

each said leg member comprising depending triangular side walls adjacent said mounting member so as to reinforce the leg member;

said cap body removably mounted on the container and provided with a generally cylindrical shape defining a circular sidewall, said side wall having a stepped inner surface defining a first, lower section having a first diameter and a second, upper section having a second diameter, said second diameter corresponding to the outside diameter of the container such that said second inner surface section is in sealing engagement with the container when said cap is mounted on the container, said first diameter being larger than said second diameter.

4,522,316
CONTAINER FOR PLASTIC SUBSTANCES

Armin Hoffmann, Germering, and Armin Herb, Peissenberg, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Apr. 29, 1983, Ser. No. 489,850
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217044
Int. Cl.³ B65D *88/54*
U.S. Cl. 222—327 **9 Claims**

1. A container for a plastic substance, such as a plastic adhesive, a filling compound, a sealing compound or putty, comprising an axially elongated sleeve having a first end and a second end spaced apart in the axial direction, said sleeve having an inner surface defining a hollow space for holding the substance, a discharge outlet located at the first end of said sleeve, said sleeve being open at the second end, an extrusion piston inserted into said sleeve and forming a closure for the hollow space inwardly of the second end of the sleeve, said piston having an outer surface in sliding contact with the inner surface of said sleeve and said piston forming a closure for the end of the hollow space closer to the second end of said sleeve, said extrusion piston arranged to be slidably displaced through the hollow space within said sleeve in the direction from the second end to the first end thereof for displacing the substance out of the hollow space in said sleeve through said discharge outlet, a sealing ring located within said sleeve between the inner surface thereof and the outer surface of said extrusion piston for forming a seal for the end of said hollow space closer to the second end of said sleeve, and said sealing ring is displaceable at least relative to said extrusion piston so that said extrusion piston can be displaced through said hollow space toward the first end of said sleeve in out-of-contact relation to said sealing ring while extruding the substance out of said space through said discharge outlet, said sealing ring has a cross-sectional configuration decreasing in the direction from the second end toward the first end of said sleeve.

4,522,317
DOSAGE DISPENSER DEVICE FOR A VISCOUS PRODUCT

Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Apr. 27, 1983, Ser. No. 488,982
Claims priority, application France, May 6, 1982, 82 07900
Int. Cl.³ B67D *5/42*
U.S. Cl. 222—391 **4 Claims**

1. In a dosage dispenser device for a viscous product comprising:

(a) a cylindrical barrel having a longitudinal axis and intended to contain a viscous product to be dispensed;

(b) a piston slidable in a leakproof manner in the barrel;

(c) a rack disposed in the barrel;

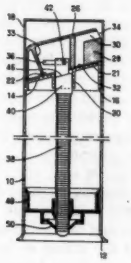
(d) means mounting the rack on the barrel for displacement parallel to the axis of the barrel between first and second positions;

(e) actuating means intended to displace the rack between its said first and second positions, said actuating means having outlet means associated therewith; and

(f) catch means integral with the piston and mounted on the rack intended to transmit the displacements of the rack to the piston when the rack is displaced in a first direction along its length and to slide along the rack when the rack is displaced in the reverse direction; the improvement wherein

(a) the actuating means for the rack comprise a slide mounted for displacement in translation in a first transverse direction having a first slope in relation to the barrel longitudinal axis; and

(b) the dosage dispenser device further comprises a first cam element and a first cam follower element, the cam element having a guide surface which is disposed in a second transverse direction having a second slope in relation to said longitudinal axis of the barrel, wherein the second slope is different from the first, and one of said first cam element and first cam follower element is integral with the slide and the other of said first cam element and first cam follower element is integral with the rack, said barrel comprising



(i) a flat wall substantially parallel to the first transverse direction along which the slide is displaced;

(ii) a dispensing opening traversing said flat wall and opening out of the interior of the barrel; and wherein the slide has

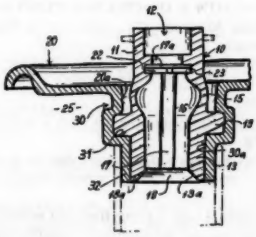
(iii) a flat part substantially parallel to the said first transverse direction and forming an obturator for said dispensing opening of the barrel; and

(iv) a dispenser duct formed in the slide and having a first opening adjacent to said obturator, said obturator and the said first opening of the dispenser duct being alternately opposite said dispenser opening of the barrel when the slide is in a respective one of a first slide position and a second slide position in relation to the barrel.

4,522,318
DISCHARGE VALVE FOR USE IN A PRESSURIZED CONTAINER

Luigi Del Bon, 141 Feldstrasse, 4663 Aarburg, Switzerland

Continuation-in-part of Ser. No. 218,084, Dec. 19, 1980, abandoned. This application May 2, 1983, Ser. No. 490,658
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.24 **2 Claims**



1. A discharge valve-and-lid assembly comprising a lid

adapted for closing a pressurized container from which a liquid product is to be dispensed, with the aid of a propellant, said lid having an opening therein, and a self-closing discharge valve mounted in said opening of said lid, said valve comprising

(a) a tubular actuating member having a substantially rigid upper end portion having an outlet orifice for the product, a substantially rigid lower end portion having an intake orifice for product into the valve, a tubular passage having an inner passage wall and connecting said two orifices at all times, a valve seat about said intake orifice; and annular recess means extending radially outwardly from said tubular passage into said inner wall thereof in an anchoring zone in said rigid upper end portion;

(b) an elongated obturating member lodged in said tubular passage spaced from said inner passage wall to permit flow of product through said passage toward said outlet orifice, said obturating member being axially displaceable, relative to said lower end portion of said actuating member, between an open position and a closed position, said obturating member having an upper and a lower end and comprising radially extending anchoring arm means projecting into said annular recess means so as to positively secure the outer end of said arm means therein against axial displacement in the upper end portion of said tubular passage, but permitting passage of product through said anchoring zone at all times, the lower end of said obturating member comprising an obturating head sealingly engaging said valve seat, when in closed position,

said tubular actuating member further comprising,

(c) an elastically foldable wall zone, intermediate said anchoring zone and said valve seat, having at least one bulge and adapted for acting as spring means, whereby, upon downward axial force being exercized on said actuating member to compress said foldable wall zone and thereby shortening said actuating member, said upper end of said actuating member forces said obturating member downward in unison therewith so that said obturating head is disengaged from said valve seat in downward direction and frees said tubular passage for product flow therethrough, and

(d) fastening means on the outside of said actuating member being adapted for fixedly connecting said tubular actuating member, at a zone thereof below said elastically foldable wall zone, with said lid when said valve is mounted in said lid opening,

said lid having about said lid opening an axially extending sleeve portion having an internal passage therethrough and radially outwardly recessed groove means therein in which said fastening means of said tubular actuating member are firmly lodged, said sleeve portion further having, downwardly from said groove means, a tubular portion snugly surrounding said substantially rigid lower end portion of the actuating member over substantially the entire length thereof, thereby enhancing the rigidity of the valve seat and ensuring a good seal with the obturating head in the closed position.

4,522,319

RETENTION DEVICE FOR FLOW RATE CONTROL TUBE WITHIN A DISCHARGE CONTAINER

Simon J. Richter, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

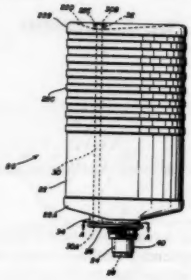
Filed Jun. 16, 1983, Ser. No. 504,865
Int. Cl.³ B67D *3/00*
U.S. Cl. 222—481.5 **10 Claims**

1. A package for dispensing liquids with a controlled rate of flow comprising:

a container having a closed end and a discharge end defining a discharge opening through which liquids may be dispensed;

a flow rate control tube having first and second open ends, the tube extending substantially longitudinally of said container with the first open end of said tube extending through said closed end of said container and said second open end disposed within said container at a predetermined distance from said discharge opening to control the flow rate of liquid through said discharge opening; and

retention means for retaining said second open end of said tube at a predetermined position laterally offset from said



discharge opening, said retention means including a socket in the wall of said container, said socket being configured to retain the open end of said tube therein;

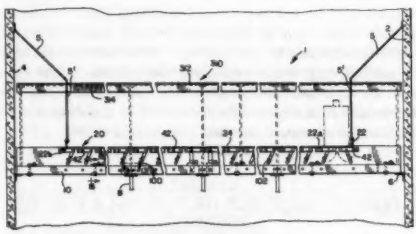
whereby said container may be filled with liquid through said discharge opening without interference from said second open end.

4,522,320

KILN FLOOR SYSTEM

Norman H. Andreasen, 1520 W. Norwood Ave., Itasca, Ill. 60143

Continuation of Ser. No. 235,656, Feb. 18, 1981, abandoned. This application Apr. 27, 1984, Ser. No. 604,400
Int. Cl.³ B67D *3/00*
U.S. Cl. 222—484 **21 Claims**



1. A kiln floor system comprising

frame means adapted to be supported within a kiln,

a plurality of kiln floor sections carried by said frame means to form an upper floor surface for retaining a quantity of grain,

each of said floor sections being pivotally mounted on said frame means for movement between a closed position and an open position to permit grain retained on said floor surface to be dumped therefrom,

each of said floor sections being pivotally mounted on an axis offset from the centerline of said floor sections to create a torque about sad axis toward said open position in said closed position of each of said floor sections under load of a quantity of grain,

force applying means operatively coupled to said plurality of floor sections to maintain said floor sections in a closed configuration and to selectively cause sequential movement of said floor sections to said open configuration for dumping the quantity of grain support thereon, said force applying means includes a plurality of pivotally mounted pneumatic cylinders respectively coupled to at least one respective

floor section, each of said pneumatic cylinders being spaced laterally outward from said floor sections in a direction parallel to said axis to be located in an aisle in spaced relationship adjacent said floor sections, the extensible end of at least some of said plurality of pneumatic cylinders are pivotally coupled to at least two floor sections,

a link member coupled to said extensible end of each of said at least some of said pneumatic cylinders and coupling said at least two floor sections to said extensible end for causing initial pivotal movement on a sequential basis of said at least two floor sections during extension of said extensible end.

4,522,321

GATE DRIVING DEVICE

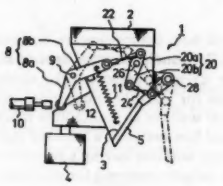
Kinjiro Kinoshita, Himeji, Japan, assignor to Yamato Scale Company, Limited, Hyogo, Japan

Filed Sep. 29, 1983, Ser. No. 537,036

Claims priority, application Japan, Oct. 5, 1982, 57-175457

Int. Cl.³ F16K *31/52*

U.S. Cl. 222—504 **4 Claims**



1. In a hopper having a discharge opening at the bottom, said opening being provided with a flapdoor type gate; a gate driving device comprising a first bell crank having first and second arms and pivoted on a horizontal axis for receiving original driving force applied to said first arm, a second bell crank having first and second arms and pivoted on another horizontal axis, a first connecting rod for connecting the second arm of said first bell crank to the first arm of said second bell crank, a second connecting rod for connecting the second arm of said second bell crank to said gate; characterized in that the locations and geometries of said bell cranks and connecting rods are selected such that, when said gate is in closed state, the second arm of said first bell crank and said first connecting rod align on a straight line, and that, when said gate is in open state, thhe second arm of said second bell crank and said second connecting rod align on another straight line.

4,522,322

SELF-OPENING CLOSURE FOR A CASTING CRUCIBLE USED IN ALUMINOTHERMIC REACTIONS

Hans Guntermann, and Gerhard Skreba, both of Essen, Fed. Rep. of Germany, assignors to Elektro-Thermit GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,689

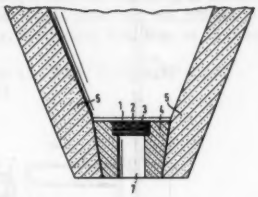
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211831

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—597 **4 Claims**

1. In a self-opening closure means for casting crucibles used in aluminothermic reactions, made of an inorganic material resistant to mechanical stresses, generating no gases when heated, and of high melting point,

the improvement which comprises that said closure means is composed of a sealing disk (2) made of a fibrous aluminum silicate, the ratio of the thickness of the sealing disk to its diameter being 1:5 to 1:1, the melting point of the aluminum silicate being equal to or greater than about 1650° C.,



and a metal plate (1) with a thickness of about 0.1 to 3 mm mounted on the sealing disk (2).

4,522,323

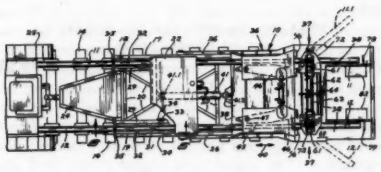
RAIL LIFTING AND BREAKING MACHINE

Roy E. LaBounty, 1607 8th Ave., Two Harbors, Minn. 55616

Filed Jul. 27, 1983, Ser. No. 517,632

Int. Cl.³ B26F *3/00*; B23P *17/02*

U.S. Cl. 225—2 **15 Claims**



1. A method of breaking railroad track rails of the type having a top with a head and a bottom with a base flange and having obverse and reverse sides, consisting in the steps of

supporting and confining the rail against tilting to its side,

placing the rail across a stationary anvil whereby an edge of the anvil traverses the obverse sides of the rail,

applying clamping pressure against the reverse side of the rail adjacent the anvil and simultaneously forming notches in the reverse sides of both the head and base flange of the rail,

and subsequently applying breaking force against the reverse side of the rail and adjacent the notches to break the rail over the anvil and in a sideward direction.

4,522,324

STITCHING DEVICE

Karl W. Schneider-Muro, In der Breiti 13, CH-8047 Zürich, Switzerland

Filed Mar. 19, 1984, Ser. No. 591,315

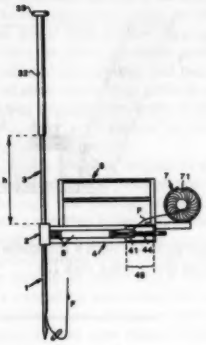
Claims priority, application Switzerland, Mar. 31, 1983, 1804/83

Int. Cl.³ D05B *85/10, 87/02, 97/10*

U.S. Cl. 223—102 **8 Claims**

5. A stitching device comprising an elongated hollow needle having a passage extending therethrough from one end to the other and having a bracket intermediate the ends thereof, a magazine holding a stack of apertured plates and mounted on said bracket and communicating with said passage, a thread-

equipped bobbin mounted on said magazine with the thread extending serially through the apertures of said plates, and a



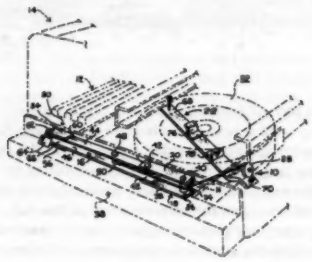
push rod mounted in said passage for sequentially pushing thread-equipped plates from said magazine out of said needle.

4,522,325

DEVICE FOR RAISING AND LOWERING A SPARE TIRE

Donnell W. McMillan, 7949 Cranberry Cir., Cupertino, Calif. 95014

Filed Oct. 24, 1983, Ser. No. 544,513
Int. Cl.³ B65D *43/04*
U.S. Cl. 224—42.21 **9 Claims**



1. A device for raising and lowering a spare tire from beneath a pickup truck's bed comprising:

(a) an elongated spare tire cross strap having a first end pivotally attached to said truck beneath said bed;

(b) a pivot base attached to said truck;

(c) a retaining member spaced from said pivot base and attached to said truck;

(d) an actuating lever having a first end attached to said pivot base by a pivot, and a second end engagable with said retaining member;

(e) a first pulley having a substantially vertical axis of rotation attached to said pivot base proximate said pivot of said actuating lever;

(f) a second pulley having a substantially horizontal axis of rotation attached to said truck beneath said bed; and

(g) a cable trained over the two pulleys having a first end attached to said actuating lever proximate said first end thereof, and having a second end attached to a second end of said cross strap;

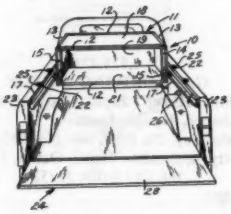
whereby moving said second end of said actuating lever towards said retaining member raises said second end of said cross strap, and moving said second end of said actuating lever away from said retaining member lowers said second end of said cross strap.

4,522,326

ROLLING TOOL BOX

Dennis J. Tuohy, III, 35 Wood Ave., Port Monmouth, N.J. 07758

Filed Apr. 10, 1984, Ser. No. 598,722
Int. Cl.³ B60P *1/52*
U.S. Cl. 224—310 **1 Claim**



1. A rolling tool box, comprising, in combination, a frame and a plurality of flat panels mounted around said frame forming a rectangular six-sided enclosure for storing tools therewithin, and means for slidably supporting said tool box between opposite side walls of an automotive truck freight bed so as to slide said tool box between a forward end and a tailgate rear end of said bed; said box having a pivotable acess door on a wall facing said tailgate rear end for placement and removal of said tools when in said tool box; and said means comprising roller plates affixed on opposite side walls of said tool box, a plurality of sidewardly extending roller shafts supported on said roller plates and each carrying a rotatable roller; and a roller-supporting track mounted on an inner side of each said freight bed side wall, each said track comprising a fixed roller-guide channel receiving said rollers, and an adapter adjacent a rear end of said channel, said adapter comprising a pivotable channel for receiving said roller, each said pivotable channel being pivoted at its closed rear end on a fastener affixed on said bed side wall, said pivotable channel being pivotable upwardly from a horizontal position aligned with said fixed channel; and a separate pole having a hook on one end for pulling or pushing said box along said tracks, and said pole being stored inside one said channelled track when not in use, for locking said box from sliding.

4,522,327

SURGICAL FASTENER APPLYING APPARATUS

Herbert W. Korthoff, Wilton, and Thomas M. Tompkins, Trumbull, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed May 18, 1983, Ser. No. 495,828
Int. Cl.³ A61B *17/04*
U.S. Cl. 227—19 **30 Claims**

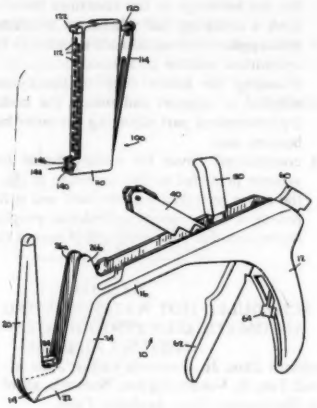
1. Apparatus for applying a plurality of surgical fasteners to body tissue in a longitudinal array comprising:

a longitudinal anvil member for receiving the ends of a plurality of surgical fasteners driven parallel to a first axis which is perpendicular to the longitudinal axis of the anvil member;

a first pin located adjacent a first end of the anvil member and having a longitudinal axis substantially parallel to the first axis;

a longitudinal fastener holding assembly containing a plurality of surgical fasteners and adapted for driving the fasteners parallel to a second axis which is perpendicular to the longitudinal axis of the fastener holding assembly, the fastener holding assembly having a first aperture adjacent a first end of the fastener holding assembly for removably

receiving the first pin, the first aperture permitting the fastener holding assembly to both translate relative to the anvil member substantially parallel to the first axis and



pivot relative to the anvil member about axes which are mutually perpendicular to the first axis and the longitudinal axis of the anvil member.

4,522,328

SHAFT SEAL

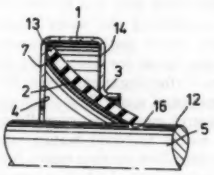
Helmut Hölzer, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,438

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204193

Int. Cl.³ F16K *41/00*; F16J *15/00*

U.S. Cl. 277—47 **17 Claims**



1. In a shaft seal having a housing (1) with first and second flanges (7, 14) which bound an inwardly open annular groove, and a seal ring (2) having gripping means at one end for anchoring the seal ring to the shaft (5) liquid tight and for rotation therewith when the seal ring is on the shaft and a sealing lip (13) at the other end which bears against the inner face (4) of the second flange (7) to complete the seal between the shaft (5) and housing (1), the improvement comprising:

the seal ring (2) having the shape of a frustrated hollow cone with the gripping means (16) at the small end thereof and closest to the first flange (14); and

the first flange (14) of the housing (1) extending inwardly far enough for an annular support surface (3) thereof to bear against the seal ring (2) between the gripping means (16) and sealing lip (13) sufficiently to deform the seal ring elastically inwardly,

whereby axial and radial vibrations of the shaft flex the seal ring against the support surface to maintain the seal at the sealing lip.

4,522,329

APPARATUS FOR PRESSING-IN BELT CONNECTORS

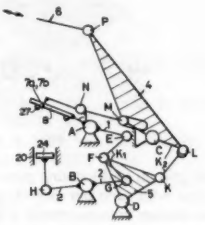
Hermann Stolz, Mühlheim, Fed. Rep. of Germany, assignor to Mato Maschinen-und Metallwarenfabrik Curt Matthaei GmbH & Co KG, Offenbach, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,814

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122592

Int. Cl.³ B25C *7/00*; B23P *11/00*

U.S. Cl. 227—153 **5 Claims**



1. An apparatus for securing belt connectors with staples to an end of a belt, comprising support means, belt end holding means mounted to said support means for holding a belt end in place during the securing of the belt connectors to the belt end, upper tool means (8) for providing a counter force, first lever means (1) journalled to a first fixed point (A) in said support means and connected to said upper tool means for operating said upper tool means, lower tool means arranged for cooperation with said upper tool means, second lever means (2) journalled to a second fixed point (B) in said support means and connected to said lower tool means (24), drive means (6,4) including a drive lever (4) journalled to a third fixed point (C) in said support means for driving said upper and lower tool means, first driven toggle lever means (K1) including a first movable toggle joint (F) and operatively interconnecting said first and second lever means (1, 2), a control lever (5) journalled to a fourth fixed point (D) in said support means, second driving toggle lever means (K2) including a second toggle joint (L) movable with said drive lever (4) and pivotally connected (at K) to said control lever (5), said control lever (5) also being pivotally connected to said first movable toggle joint (F) for operating said upper tool means in advance of operating said lower tool means to provide a non-symmetrical closing movement of said upper tool means relative to said lower tool means and for locking said driven toggle lever means (K1) into a fixed position when said drive lever (4) has reached a certain position to permit further operation of said drive lever (4) without driving said first and second lever means.

4,522,330

GRID AND SLEEVES WELDING FIXTURE AND METHOD

John S. Kerrey, and Robert Duncan, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,203

Int. Cl.³ B23K *37/04*

U.S. Cl. 228—182 **10 Claims**

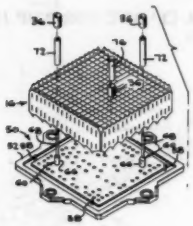
1. A method for assembling a grid and sleeves for welding comprising:

providing a grid of intersecting straps forming uniform size square cells with strap edges coplanar on one side of said grid;

providing a plurality of sleeves for joining to said grid at said one side thereof, said sleeves having an inner diameter substantially equal to the distance between opposing faces of straps forming a cell;

providing a flat plate comprising positioning means, and

having abutment means and spaced locating pins extending from a surface thereof, said pins each having a large diameter portion adjacent said plate for mating with the straps forming a said cell remote from said side of said grid, said pins each having a small diameter portion extending beyond said large diameter portion;



placing said grid on said locating pins and against said abutment means with each pin extending into a cell; and

placing said sleeves in engagement with grid straps forming cells of said grid into which said pins extend.

4,522,331

METHOD OF BRAZING WITH LOW MELTING POINT COPPER-TIN FOILS

Howard H. Liebermann, and Claude D. Tahlmore, both of Randolph Township, Morris County, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 3, 1983, Ser. No. 500,740

Int. Cl.³ B23K *35/30, 35/14;* **C22C** *9/02*

U.S. Cl. 228—263.18 **3 Claims**

1. A process of brazing together two or more metal parts which comprises:

(a) interposing a filler metal between the metal parts to form an assembly, the filler metal having a melting point less than that of any of the parts;

(b) heating the assembly to at least the melting temperature of the filler metal; and

(c) cooling the assembly; wherein the improvement comprises employing, as the filler metal, a homogeneous copper based foil having a composition consisting essentially of 0.1 to 28 atom percent tin, said foil formed from a melt of said composition at a quenching rate of at least about 105° C./S, the balance being copper and incidental impurities.

4,522,332

VOLUME EXPANDING BEVERAGE PACKAGE

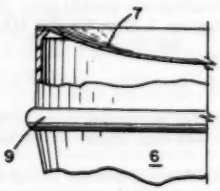
Werner G. Munk, Bergstrasse 12, D-7981 Vogt über Ravensburg, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,773

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205751

Int. Cl.³ B65D *43/08*

U.S. Cl. 229—43 **10 Claims**



1. A non-returnable beverage package for enclosing a beverage and capable of being opened for having, and enjoying the beverage comprising

a container having rotation symmetry for the beverage adapted to be capable of expanding the volume available for the beverage in the container based on a cup sealed with a covering foil where the container has an upper about cylindrical section constructed to fit closely under a cylindrical section of a hood cover, an outer bead surrounding the lower edge of the cylindrical part and adapted to support and match the hood edge, a lower frustro-conical part adjoining the outer bead, and a closed bottom; and

a coordinated cover for sealing liquid for enlarging the volume provided to the beverage in the package, where the cover provides volume itself and is formed as a hood having a lower about cylindrical portion and an upper frustro-conical part, which is closed at the top.

4,522,333

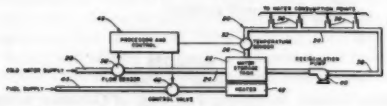
SCHEDULED HOT WATER HEATING BASED ON AUTOMATICALLY PERIODICALLY ADJUSTED HISTORICAL DATA

Frederick Blau, Jr., Fountain Valley; John M. Gross, San Jose, and Tom R. Vandermeyden, Norwalk, all of Calif., assignors to Fluidmaster, Inc., Anaheim, Calif.

Filed Sep. 16, 1983, Ser. No. 532,665

Int. Cl.³ F23N *1/08*

U.S. Cl. 236—20 R **32 Claims**

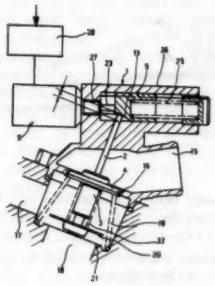


1. In a water heater control system for constantly controlling the heating and use of hot water from a water tank of the type having water inlet and outlet means for feeding water to and from the tank, heating means for heating the water at the tank, heating control means for controlling the heating means, adjustable water temperature sensing means for sensing water temperature at the water tank and by controlling the heating control means maintaining the water temperature between determined limits, water distribution means operably connected to the water means for distributing hot water for use; the control system further including: water flow sensing means for sensing an amount of water flow through said water tank; processor and control means operationally connected to said heating control means and said water temperature sensing means and said water flow sensing means for determining the start of a particular time period which is one of a definite group of consecutive time periods and each is a repeat of the same one of preceding groups of time periods, for setting said heating control means and said water temperature sensing means and said water flow sensing means for throughout said particular time period exactly according to the overall averages of actual settings recorded in actual use during at least a certain previous of said same one of a previous group of time periods, for actually recording settings directly exactly as they occur of said heating control means and said water temperature sensing means and said water flow sensing means throughout and according to the water actually used during the particular time period and actual degrees of temperature above a given agreed upon minimum required for maintaining hot water with its use, for repeating for each succeeding of said group of consecutive time periods to the end thereof, for starting and continuing using a next group of consecutive time periods and based on the present actually recorded settings of certain previous groups of consecutive time periods, for continuing with following groups of consecutive time periods and based on actually recorded settings taken at least from certain preceding of said groups of consecutive time periods.

4,522,334
THERMOSTATIC CONTROL DEVICE

Roland Saur, Stuttgart, Fed. Rep. of Germany, assignor to Behr-Thomson Dehnstoffregler GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,192
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226104
Int. Cl.³ F01P *7/02*
U.S. Cl. 236—34.5 **21 Claims**

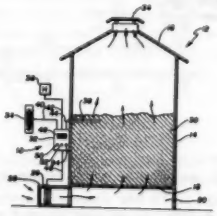


1. An apparatus for the regulation of the temperature in a cooling circulation of a combustion motor which includes a thermostatic valve means for controlling the cooling medium flow from the combustion motor through a direct return and a heat exchanger to the combustion motor, said valve means including a thermostatic working element having a housing which supports a valve plate for controlling flow leading to the heat exchanger and a working piston which engages against an abutment body within an abutment housing and which moves outwardly in response to heating; wherein a second thermostatic working element is provided as a position adjusting member connected to said abutment body, and wherein the position of said abutment body is adjustable such that the point of engagement with said working piston may be varied to change the distance to said housing and valve plate.

4,522,335
METHOD AND APPARATUS FOR AERATION OF STORED GRAIN

Daniel R. Kallestad, Excelsior, Minn.; Bruce A. Kress, Laura, Ohio, and Kenneth I. Satre, Frost, Minn., assignors to Sentry Technologies, Inc., Excelsior, Minn.

Filed Dec. 30, 1983, Ser. No. 567,427
Int. Cl.³ F26B *21/00*; E04H *7/00*
U.S. Cl. 236—44 C **20 Claims**



1. A method for controlling aeration of stored grain which is to be maintained at or near a specified desired grain moisture content comprising the steps of:

measuring the current ambient air temperature;

measuring the current ambient air relative humidity level;

determining the equilibrium moisture content corresponding to said current ambient temperature and relative humidity readings;

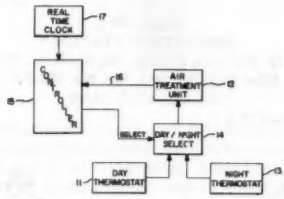
determining a running average ambient temperature from a plurality of time-spaced measurements of ambient air temperature taken over a specified period of time; and

aerating said grain when said current ambient air temperature is within a predetermined acceptable range of said running average ambient temperature and said equilibrium moisture content is within a predetermined acceptable range of the desired grain moisture content.

4,522,336
ADAPTIVE OPTIMUM START/STOP CONTROL SYSTEM

Charles H. Culp, Vernon Hills, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 9, 1982, Ser. No. 448,148
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—46 R **12 Claims**



1. An adaptive optimum start/stop controller for controlling an air treatment apparatus at a reduced energy consuming level during periods of non-occupancy of a building and for energizing the air treatment apparatus before occupancy so that the building is comfortable by occupancy, said controller comprising:

temperature sensing means for sensing space temperature within said building;

controller means responsive to said temperature sensing means and to real time for determining optimum start/stop times so that said building is controlled at energy conservation levels during non-occupancy and comfortable levels during occupancy, said controller means adjusting said optimum start/stop times based upon whether space temperature attained a desired temperature during a prior start/stop operation within an accuracy window of time encompassing the start of a corresponding prior occupancy/non-occupancy period; and,

communication means adapted to connect said controller means to said air treatment apparatus.

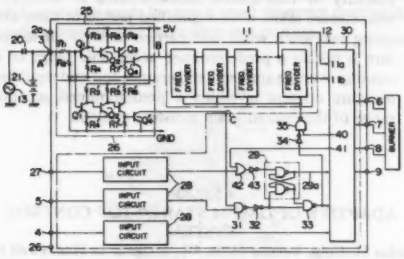
4,522,337
DIGITAL CONTROL CIRCUIT

Kenzi Toudo, and Motoshi Miyanaka, both of Yanai, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,454
Claims priority, application Japan, Mar. 26, 1982, 57-47198
Int. Cl.³ F23N *5/20*; H03K *5/13*
U.S. Cl. 236—46 F **11 Claims**

11. A digital control circuit comprising means for providing a clock pulse signal of predetermined magnitude; control means responsive to said clock pulse signal and at least one control signal for generating a first signal for controlling a load; detection means connected to the output of said clock pulse signal providing means for detecting the magnitude of the pulses of said clock pulse signal and for generating a second signal when said magnitude falls below a preselected voltage

level; and means connected to said detection means for preventing generation of said first signal by said control means in



response to receipt of said second signal; said control means comprising combustion control means for a burner.

4,522,338

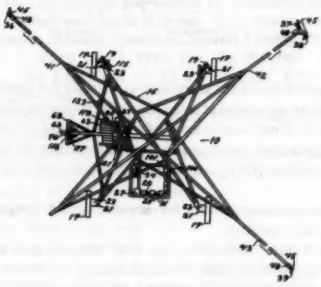
IRRIGATION SYSTEM

Christopher G. Williams, 1106 E. 5th, Spokane, Wash. 99202

Filed Dec. 30, 1982, Ser. No. 454,549

Int. Cl.³ A01G *25/09*

U.S. Cl. 239—177.2 **21 Claims**



1. An irrigation system, comprising:

a water delivery pipe;

cart means for movably supporting the water delivery pipe;

drive means on the cart means for selectively moving the cart means and water delivery pipe;

sprinkler guns spaced longitudinally along the water delivery pipe, rotatable thereon about axes for delivering water in overlapping spray patterns;

selectively operable motor means for each gun for driving the sprinkler guns to rotate about the axes; and

rotational speed control means connected with the motor means for selectively controlling the individual motor means to vary the rotational speed of each gun such that water application rates can be selectively varied about the overlapping spray patterns.

4,522,339

IRRIGATION FITTING WITH INSTALLATION BARB AND ASSOCIATED BARB INSTALLATION TOOL

Robert B. Costa, Santee, Calif., assignor to RIS Irrigation Systems, El Cajon, Calif.

Filed Jun. 3, 1983, Ser. No. 500,779

Int. Cl.³ B05B *15/00*

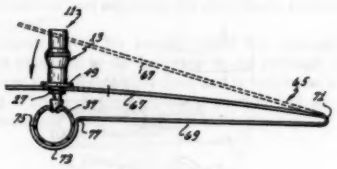
U.S. Cl. 239—272 **18 Claims**

1. An irrigation fitting cooperable with an installation tool to penetrate the wall of an irrigation conduit, said irrigation fitting comprising:

a body having a flow passage therein opening at a first location adjacent one end of the body;

said one end of said body being shaped to form a piercing point for penetrating the wall of the irrigation conduit whereby said one end of said body can enter the irrigation conduit and the opening can communicate with the interior of the irrigation conduit;

said flow passage opening at a second location spaced from said first location;



a shoulder on said body intermediate said first and second locations so that the installation tool can be moved generally radially of the fitting over the shoulder to engage the shoulder to force the piercing point to penetrate the wall of the irrigation conduit; and

orienting means on said body intermediate said shoulder and said second location and adjacent the shoulder for engaging the installation tool when the installation tool engages the shoulder to angularly orient the irrigation fitting relative to the installation tool.

4,522,340

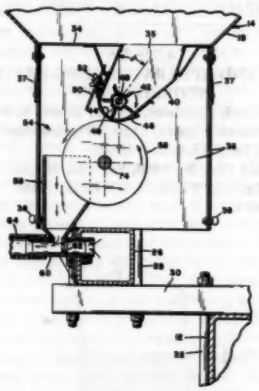
GRANULAR MATERIAL APPLICATOR WITH SPEED COMPENSATOR

Dale E. Gandrud, Owatonna, Minn., assignor to Gandy Company, Owatonna, Minn.

Filed Jul. 1, 1983, Ser. No. 509,658

Int. Cl.³ A01C *15/04*

U.S. Cl. 239—654 **12 Claims**



8. Apparatus for applying granular materials, which comprises:

a hopper having a closed arcuate bottom end with a plurality of laterally spaced-apart predetermined discharge openings therein, the arcuate bottom end of said hopper being oriented at a predetermined acute angle of inclination off vertical;

an adjustable gateplate mounted on the bottom end of said hopper, said gateplate having a plurality of similar laterally spaced-apart openings therein for registry with the

openings in said hopper to form adjustable composite material discharge openings;

a feed rotor mounted for rotation inside the bottom end of said hopper;

the openings in said hopper and said gateplate including substantially straight, lowermost edges oriented substantially parallel to the rotational axis of said feed rotor;

a plurality of transfer rollers mounted for rotation beneath and having uppermost portions located closely adjacent to the bottom end of said hopper near the lowermost edges of the discharge openings for receiving material urged through the opening by said feed rotor, said transfer rollers and feed rotor being rotatable about substantially parallel transverse axes;

means underlying a portion of said rollers opposite said hopper bottom for receiving material from said transfer rollers and distributing the material for application; and

means for effecting rotation of said feed rotor and transfer rollers in opposite directions responsive to travel of the applicator so that material is fed through the discharge opening by said feed rotor onto said revolving transfer means for transfer.

4,522,341

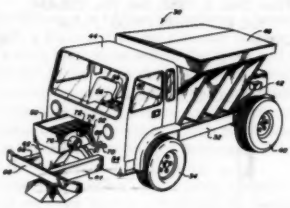
ADAPTABLE MATERIAL SPREADING VEHICLE

Albert J. Wall, 462 Lexington St., and James T. Wall, 137 Russell St., both of Woburn, Mass. 01801

Filed Aug. 30, 1983, Ser. No. 527,700

Int. Cl.³ E01C *19/20*

U.S. Cl. 239—672 **11 Claims**



1. An adaptable material spreading vehicle comprising:

a vehicle body having a frame and front and rear wheels;

an engine mounted to the frame over the rear wheels and operably connected to drive the rear wheels;

a cab forwardly mounted to said frame, said cab having a longitudinally extending channel therethrough and having front and back walls each having a port adjacent an end of said channel;

a removably mounted hopper between said cab and said engine;

a conveyor positioned through said cab and extending both beneath said hopper and ahead of said cab;

a spreader attached to the end of said conveyor ahead of said cab, said spreader being visible from said cab; and means for driving said conveyor and spreader.

4,522,342

IMPACT MILL

Dieter Münschenborn, Schwerte, and Robert Rautenbach, Aachen, both of Fed. Rep. of Germany, assignors to Heinrich Nickel, Dortmund-Mengede and Ernst Eggeling, Dortmund-Lucklemberg, both of, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,497

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3242950; Nov. 20, 1982, 3242951

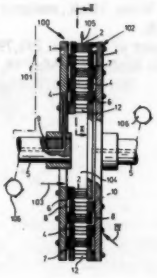
Int. Cl.³ B02C *13/22*

U.S. Cl. 241—57 **12 Claims**

1. In an impact mill having a housing containing a milling unit centrally supplied with a material to be milled and peripherally discharging comminuted material, the improvement wherein said milling unit comprises:

a pair of counterrotating discs rotatable about a common axis, each formed with a multiplicity of angularly spaced milling tools in respective rotation circles centered on said axis reaching toward an opposite disc whereby the tools of said discs interdigitate; and

at least two diametrically opposed pocket-forming vanes on each of said tools extending substantially radially there-



from, one of said vanes of each tool being more remote from said axis than the other vane of the respective tool, the said one of said vanes being inclined forwardly in a direction of rotation of the respective disc at an angle greater than 0° and up to 20° to a radius from said axis and the said other vane of each tool being inclined rearwardly with respect to the direction of rotation of the respective disc at an angle greater than 0° and up to 20° to a radius from said axis.

4,522,343

MICRONIZED GRINDING APPARATUS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Dec. 13, 1982, Ser. No. 448,950

Int. Cl.³ B02C *15/02, 15/08, 23/40*

U.S. Cl. 241—58 **3 Claims**

1. In an apparatus for grinding coal to micron fineness in a grinding chamber having a circumferential wall supporting a grinding surface, grinding rolls operably mounted in the grinding chamber to grind coal against said grinding surface, means for introducing coal to said grinding chamber, air bustle means surrounding the grinding chamber and receiving a supply of air, and a plurality of openings to and spaced around the circumferential wall of the grinding chamber, the improvement characterized in the mounting of air flow restrictor means in the circumferential wall openings, all of said restrictor means comprising tubes having a somewhat restricted throat like a venturi thereby presenting openings between the air bustle and the grinding chamber for directing the air flow at increased velocity into a like number of horizontal streams substantially tangentially along the circumferential wall and to cause rapid spinning of the mass of the coal particles for substantially

evenly distributing coal and air along the grinding surface, and said restrictor tubes creating a back pressure on the air in the air bustle to substantially evenly distribute the air throughout the air bustle and direct the air flow at said increased velocity into the grinding chamber so as to force the mass of the coal particles to follow streams substantially tangential to the circumferential wall.

4,522,344

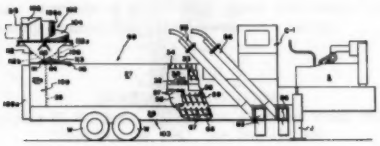
WOOD CHIP SCREENING AND PROCESSING METHODS AND APPARATUS

Norval K. Morey, Winn, Mich., assignor to Morbark Industries, Inc., Winn, Mich.

Continuation-in-part of Ser. No. 291,795, Aug. 10, 1981, Pat. No. 4,396,501. This application May 10, 1983, Ser. No. 493,296

Int. Cl.³ B67B *13/00*

U.S. Cl. 241—79 **10 Claims**



1. Apparatus for separating and classifying chipped whole trees comprising a mix of wood and bark overs, wood chips including some with adhering bark, and bark and leaf fines, comprising:

a. a whole tree chipper;

b. a vehicular frame;

c. receptacle means thereon for receiving chipped whole tree material from the chipper;

d. a first screen system, with openings of a size to pass the wood chips and fines, and retain the overs, mounted on the frame to receive the mix from the receptacle means;

e. an underlying second screen system on said frame, with openings of a reduced size to pass the fines and retain the wood chips, extending at least partially coextensively with said first screen system;

f. a conveyor on said frame for receiving the fines underlying the second screen system; and

g. means for selectively bypassing the screen systems and directing the chipped whole tree material received by said receptacle means directly to the fines conveyor.

4,522,345

APPARATUS FOR WINDING WIRE NET WITH SIMPLE TWIST

Pierre Pilboue, Charleville, France, assignor to Trefileries et Cableries Chiers-Châtillon-Gorcy, Lavallois-Perret, France

Division of Ser. No. 216,656, Dec. 15, 1982, Pat. No. 4,389,025. This application Jun. 20, 1983, Ser. No. 506,038

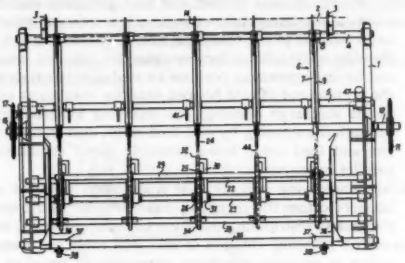
Claims priority, application France, Dec. 19, 1979, 79 31109

The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.

Int. Cl.³ B65H *17/06, 17/20*

U.S. Cl. 242—55 **8 Claims**

1. Apparatus for folding wire mesh fed in the form of an elongated sheet composed of simple twist rows of the type in which each row of mesh is of zig-zag configuration with alternate generally V-shaped equally spaced peaks and valleys, the peaks of one row are looped through the valleys of an adjacent row to connect the rows together, and adjacent rows of mesh can be folded back alternately toward each other in accordian fashion around lines of articulation formed by the looped-together peaks and valleys of adjacent rows, said apparatus comprising, at least two supports each having an upwardly facing surface for receiving said mesh, said surfaces of said support being elongated in the direction of feed of the mesh sheet, and in spaced-apart vertical planes in the path of and parallel to the direction of feed of the mesh sheet, said surfaces of said supports being spaced from each other by a distance substantially equal to a multiple of the distance between the



peaks of the rows of mesh, to enable said upwardly facing surfaces of the supports to engage and support the mesh at the underside of peaks and valleys to permit the mesh to fold by gravity about said lines of articulation.

4,522,346

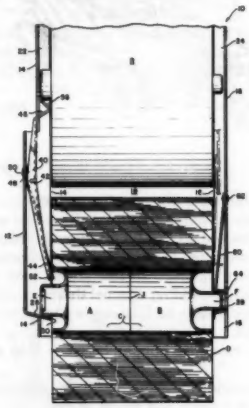
METHOD AND APPARATUS FOR DISPENSING WEB MATERIAL FROM SPLIT CORE ROLLS

Paul W. Jespersen, Houston, Tex., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Dec. 6, 1983, Ser. No. 558,454

Int. Cl.³ B65H *19/00, 19/04*

U.S. Cl. 242—55.3 **15 Claims**



7. A dispenser for rolls of flexible web material wound on axially aligned core sections defining an intact roll core while web material remains wound on such sections comprising:

a housing providing opposed parallel track means extending between roll dispensing and reserve roll positions within said housing to guidingly receive roll core supports projecting from opposite ends of the rolls;

abutment means associated with said track means to retain a first roll in said roll dispensing position; and

lever means pivotally mounted on said housing having a lower sensing end to sense an intact roll core in said dispensing position and an upper support end to retain a second roll in said reserve roll position, said support end of said lever means retaining said second roll in said reserve position during sensing of an intact core in said dispensing position and said sensing end tending to buckle

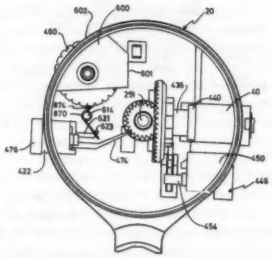
the core sections upon exhaustion of web material from the intact roll core to disengage the core sections from said track means whereupon said lever means shifts said support end to free said second roll from retention in said reserve roll position to move to said roll dispensing position.

4,522,347

DRAG ADJUSTMENT CLICK SPRING ASSEMBLY

Steven L. Swisher, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 5, 1983, Ser. No. 539,314
Int. Cl.³ A01K *89/00*
U.S. Cl. 242—84.5 A **14 Claims**



8. In a fishing reel of the type having a housing, a line-carrying spool, a friction creating member positionable against the spool, a deck plate upon which the spool and friction creating member are mounted, a drag wheel mounted with the deck plate for rotation about a substantially longitudinally extending axis, means for varying a force applied between the spool and the friction creating member which is actuated by rotation of the drag wheel, and means for indicating and restraining rotation of the drag wheel comprising:

a plurality of notches on the drag wheel; a

spring member having a resilient leg engageable with the notches; and

means for removably slip-fitting the spring member with the reel without the use of separate fasteners, the resilient leg interacting with the notches to restrain rotation of the drag wheel and produce an audible clicking sound to remind the reel operator of the rotation of the drag wheel.

4,522,348

PORTABLE, MANUALLY OPERABLE DISPENSER FOR STRETCH FILM AND THE LIKE, AND PROCESS OF APPLYING

Russell B. Strout, Winchester, and Jerold J. Golner, Lowell, both of Mass., assignors to Borden, Inc., Columbus, Ohio

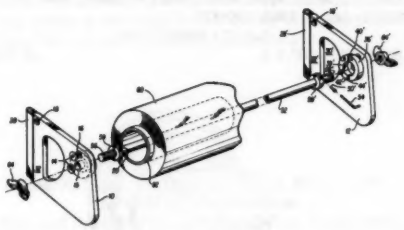
Filed Jul. 13, 1982, Ser. No. 397,939
Int. Cl.³ B65H *23/06*
U.S. Cl. 242—96 **7 Claims**

1. A dispenser for a web of wrapping material in the form of a roll of the material that is wound on a tubular core, comprising

at least one side member having a side plate with a hand hold opening and a bearing member disposed thereon for supporting the core of said roll and permitting the core and roll to rotate for dispensing the web of wrapping material from the roll, wherein

said bearing member is in the form of a means insertable in the core, and includes a bearing surface on which the core end can rotate, said bearing surface further having at least one part that is expandable for engagement against the inside surface of the core to function as a braking means to permit tensioning of the film as the film is paid out, and

a brake controller including a pushable member mounted within said hand hold opening, a push rod mounted for reciprocating movement on said side plate and oriented substantially perpendicularly to the axis of rotation of the roll, said push rod being operatively connected to said pushable member and to said bearing member, said controller being operable through a squeezing force applied by a hand inserted within said hand hold opening and squeezing said pushable member to cause engagement of



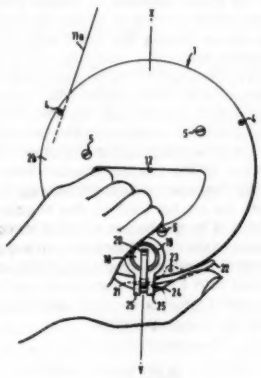
said expandable part to a desired degree to adjust the braking force on the core while said core is rotating on said bearing member and thereby control the tension in the wrapping material as it is applied, wherein said brake controller and said bearing member coact to provide a mechanical advantage between the squeezing force and the resulting braking force.

4,522,349

HAND-HELD FISHING REEL

Ernest J. Clerk, 18 South Av. Rest Pen, Kingston 10, Jamaica

Filed Aug. 22, 1983, Ser. No. 525,466
Claims priority, application United Kingdom, Sep. 2, 1982, 8225043
Int. Cl.³ B65H *75/40*
U.S. Cl. 242—96 **5 Claims**



1. A hand-held fishing reel comprising: a housing having an opening therein suitable for inserting a hand to hold the housing; an annular spool rotatably mounted with respect to the housing and having a central opening therein bounded by an inner spool surface, the central opening in the spool always being concentric with the opening in the housing; gear teeth arranged around the said inner spool surface; a gear wheel rotatably mounted within the housing that meshes with the said gear teeth; a crank handle located on one side of the housing; and a shaft passing through the said housing and connecting the handle to the gear wheel, wherein the gear

wheel engages the said teeth along an edge portion of the inner spool face remote from the handle.

4,522,350

SAFETY BELT EMERGENCY LOCKING RETRACTOR

Hans-Hellmut Ernst, Sulfeld, Fed. Rep. of Germany, assignor to Britax-Kolb GmbH & Co., Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,946

Claims priority, application United Kingdom, Nov. 20, 1982, 8233186; Jan. 5, 1983, 8300178

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107.4 A 14 Claims

1. An emergency locking retractor comprising a pair of mutually parallel frame members, a spool comprising a shaft to receive the belt, a respective disc, having teeth on its periphery, mounted adjacent to each end of the shaft, complementary locking formations on the frame members, bearing rotatably mounting the spool on the frame members so as to permit limited translational movement of the spool relative to the frame members in a direction perpendicular to the axis of rotation of said spool between an engaged position in which said teeth of said disc engage with said complementary locking formations on the frame members to inhibit rotation of the spool and a disengaged position in which the spool is free to rotate, resilient means biasing the spool into its disengaged position, and inertia responsive actuating means arranged to cause movement of the spool into its engaged position, wherein the actuating means comprises a rachet wheel mounted on the spool for rotation and translational movement therewith, a pivotally mounted control member, a pawl pivotally mounted on one of the control member and the ratchet wheel, ratchet teeth on the other of the control member and the ratchet wheel, and inertia responsive means for moving the pawl into engagement with the ratchet teeth so that angular movement of the ratchet wheel in the belt unwinding direction causes angular movement of the control member, such angular movement of the control member being arranged to cause movement of the spool into locking engagement with the frame members, the control member moving with the spool as the latter moves into locking engagement.

4,522,351

MOTOR DIFFERENTIAL DRIVE REEL TENSIONING SYSTEM

Richard J. Yessian, Martinsville, and William A. Oetting, Green Brook, both of N.J., assignors to Lockheed Electronics Company, Inc., Plainfield, N.J.

Filed Sep. 30, 1983, Ser. No. 537,579

Int. Cl.³ B65H *59/38, 59/40*

U.S. Cl. 242—189 16 Claims

1. A compact, low power reel drive web tensioning system comprising:

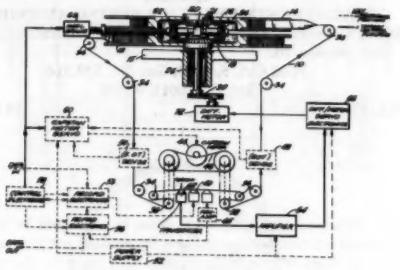
(a) a first rotatably mounted supply reel;

(b) a second rotatably mounted reel;

(c) differential gear means coupled to said first and second reels to permit counter-rotation of said reels at different speeds;

(d) a variable torque motor coupled to said differential gear means for rotating said first and second reels;

(e) inductive transducer means for sensing the tension in said web, said transducer means being adapted to engage the tape and provide an output corresponding to the tension in said tape; and



(f) servo-control means having an input connected to the output of said transducer means and an output connected to said motor for controlling same, said servo-control means varying the output supplied to said motor to vary the torque of said motor to maintain constant tension on said web.

4,522,352

DRIVE AND MOUNTING FOR COAXIAL TAPE REELS

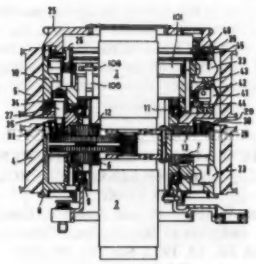
Gerhard Falk, Rossdorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,086

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312817

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—193 2 Claims



1. Combined driving and mounting device for first and second tape reels for a machine in which said tape reels are used in coaxial alignment, each reel having its individual motor and drive and being mountable on respective first (10) and second (11) hollow hub structures aligned on a common axis, said hub structures together substantially surrounding said drives (12, 13; 6, 7) and at least a portion of each of said motors (2, 3) and having cylindrical outer surfaces for centering said reels, said second hub structure (8) having, at its axial end facing away from said first hub structure (10), at least one support element affixed thereto (21) for said second reel, said support element protruding radially from said cylindrical surface of said second hub structure, said device further comprising:

a rotary actuating control crown (25) centered on said common axis and fitting within and protruding from the end of

said first hub structure (10) facing away from said second hub structure (8), said control crown (25) being mounted so as to permit control rotation thereof relative to at least said first hub structure (10);

a first set (37, 37', 37") of a plurality of arc-shaped single-arm levers and a lever support ring (35) therefor on which said levers of said first set are pivoted at one end of said respective levers, said lever support ring (35) being disposed at the end of said first hub structure (10) facing said second hub structure (8) and said levers providing movable support elements (137,137', 137") for said first reel (5), a mechanical linkage (27, 27', 27", 34, 43) being provided between said control crown (25) and said levers of said first set for making said support elements movable radially so as to be selectively protruding radially from and withdrawn radially within a circle concentric with said cylindrical surface of said first hub structure;

first (45) and second (28) threaded clamp support rings screwed respectively interiorly into said first (10) and second (8) hub structures, said first support ring being at the end of said first hub structure facing away from said second hub structure and said second support ring being at the end of said second support structure facing said first support structure, each said clamp support ring having a pair of arc-segmental single-arm levers (29, 40) pivoted thereon at diametrically opposite positions on said ring and a pin-and-guideway circumferentially sliding positioning engagement (97, 98; 93, 99) for the respective ends of said levers opposite their pivoted ends, said levers (29, 40) of said clamp support rings having protrusions (30, 39) in their mid-portions;

rotary cam and follower mechanisms (95) for each of said clamp support rings for selectively urging outward said protrusions of levers of the respective rings in response to an initial rotation of the respective ring relative to the respective hub structure in which the ring is threaded produced by actuation of said control crown (25), said control crown being actuatable further for clamping a reel by means of said protrusions in response to further rotation of the respective ring in its threaded mounting, said control crown (25) being similarly actuatable in the reverse direction for unclamping the reel and for permitting said protrusions to spring back to a position clearing the respective hub structure for axial removal of a reel.

4,522,353

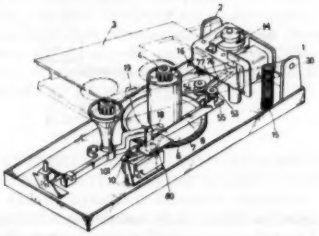
AUTOMATIC CASSETTE EJECTING DEVICE

Chun T. Yeh, No. 6, Lane 308 Pao-Shan Rd., Hsinchu City, Taiwan

Continuation-in-part of Ser. No. 208,190, Nov. 19, 1980, Pat. No. 4,380,322. This application Oct. 4, 1983, Ser. No. 538,795

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—198 **3 Claims**



1. An improved tape rewinding apparatus for a video cassette including a frame and a motor mounted therein, a cassette compartment lid having an end pivoted to said frame, and a winding spindle driven by a transmission belt, the apparatus comprising:

catch means disposed at said cassette compartment lid for fastening and holding said cassette compartment lid in a closed position; and

a tension sensing member abutting against said transmission belt on both a tight side strand and a slack side strand of said transmission belt in such a direction that with increasing belt tension, said tension sensing member is moved to actuate said catch means in response to an increase in the tension difference between said tight side strand and said slack side strand of said transmission belt when the winding spindle is precluded from rotating while the transmission belt is urged to move by said motor.

4,522,354

FISHING REEL HAVING A SPOOL ROTATION CONTROL MECHANISM

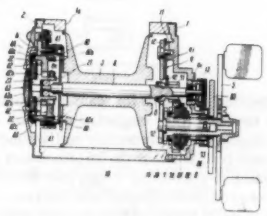
Jun Sato, and Hideki Nakajima, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 5, 1983, Ser. No. 539,173

Claims priority, application Japan, Oct. 13, 1982, 57-155550[U]

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—219 **3 Claims**



1. A fishing reel comprising:

a pair of frames;

a spool shaft supporting a spool, said spool shaft being supported rotatably between said frames;

a drive mechanism for driving said spool shaft and comprising a handle shaft supporting a handle, a main gear supported rotatably to said handle shaft, a drag mechanism for transmitting a driving force from said handle shaft to said main gear, and a pinion engageable always with said main gear;

a clutch provided between said spool shaft and said pinion;

a clutch operating mechanism for operating said clutch to engage or disengage said spool shaft to or from said drive mechanism;

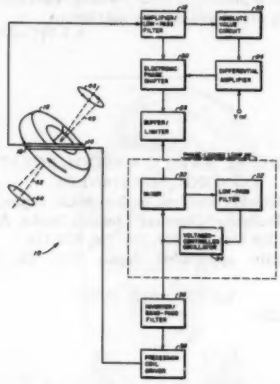
a first anti-reverse-rotation mechanism for preventing said spool shaft from reverse rotation when said clutch is engaged, said first anti-reverse-rotation mechanism comprising a stopper gear rotating together with said main gear, a stopper supported movably to one of said frames and engageable with said stopper gear so as to impede reverse rotation of said main gear, and an operating member supported to said frame for operating said stopper causing it to engage with or disengage from said stopper gear; and,

a second anti-reverse-rotation mechanism for allowing said spool, when said clutch is engaged, to reversely rotate through said drag mechanism, said second anti-reverse-rotation mechanism comprising an anti-reverse-rotation gear fixed to said handle shaft and an anti-reverse-rotation pawl pivotably supported to said frame for engaging with said anti-reverse-rotation gear.

4,522,355
APPARATUS FOR SCANNING A ROTATING GYROSCOPE

Robert D. Moran, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1983, Ser. No. 499,576
Int. Cl.³ F41G 7/36; G01C 19/28
U.S. Cl. 244—3.2 **5 Claims**



1. An improved apparatus for scanning a rotating gyroscope of the type having a rotor magnet, a cage coil disposed about said rotor magnet and a precession coil wound contiguous to and under said coil, wherein the improvement comprises:

first operatively connected to said cage coil for phase shifting a cage coil derived signal as a function of its amplitude;

a phase-locked loop operatively connected at its input to the output of said first means and having a free running frequency approximately equal to the spin frequency of said rotor magnet so that said phase-locked loop locks-up upon the application of the phase shifted cage coil derived signal from said first means, and so that said phase-locked loop outputs a waveform that is 180° out of phase with the phase shifted cage coil derived signal at its input; and

second means operatively connected at its input to the output of said phase-locked loop and at its output to said precession coil for driving said precession coil with a constant amplitude signal phase-locked to the phase shifted cage coil derived signal so as to drive said rotor magnet about its spin axis in a predetemined scan pattern about the missile body axis of an associated missile system.

4,522,356
MULTIPLE TARGET SEEKING CLUSTERED MUNITION AND SYSTEM

Clair K. Lair, Upland; Jules Jonas, Claremont, and Keith D. Anderson, Upland, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 12, 1973, Ser. No. 415,452
Int. Cl.³ F41G 7/22; F42G 13/32
U.S. Cl. 244—3.15 **4 Claims**

1. A multiple target seeking clustered munition system, comprising:

a plurality of target seeking missiles arranged in a cluster, each of said missiles having a body with aerodynamic sustaining and controlling surfaces mounted thereon;

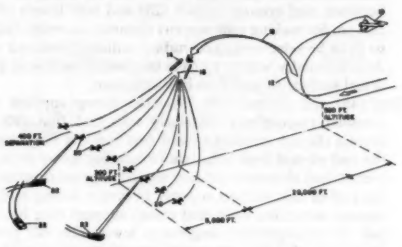
conveyance means for holding and carrying said clustered missiles, and including means for releasing the missiles therefrom in the vicinity of a target;

target seeking means operably mounted in said missile body, the target seeking means including a receiver sensitive to radiation from a target and its surroundings, and having means for identifying the target against the background;

a receiving antenna coupled to said receiver;

drive means for driving the antenna in a search scan pattern, and being responsive to signals from the target seeking means to drive the antenna in a target tracking scan upon identification of a target;

target identification means having pulse amplitude and pulse width discriminating means for identifying a target signal pulse in a background signal of different and substantially constant level, and including pulse counting means for



determining the number of target pulses in each scan of the antenna;

propulsion means operably mounted in said missile body for propelling said missile in cruising flight after release from the conveyance means;

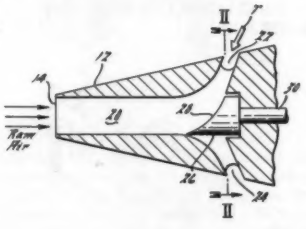
a warhead operably mounted in said missile body;

and guidance means coupled to said controlling surfaces, said guidance means being responsive to signals from said target seeking means to guide said missile in cruising flight and, upon identification of a target, to operate said controlling surfaces and guide the missile to the target.

4,522,357
RAM AIR STEERING SYSTEM FOR A GUIDED MISSILE

William R. Bains, Lake Elsinore, and Calhoun W. Sumrall, Irvine, both of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Jan. 19, 1983, Ser. No. 489,662
Claims priority, application PCT Int'l Appl., Jan. 19, 1983, PCT/US83/00082
Int. Cl.³ F41G 7/00; B64C 21/08
U.S. Cl. 244—3.22 **3 Claims**



1. A system for directionally controlling a fired projectile spinning at a predetermined rate in a predetermined direction when traveling over its flight path comprising:

means at the nose end of said projectile for defining a cylindrical chamber having one end open for receiving ram air;

a pair of oppositely disposed air passages extending from said chamber means to opposite sides of said projectile;

means between said chamber means and said passages for responsively diverting said ram air in a predetermined

direction through at least one of said passages to control the steering direction of said projectile; and

wherein said diverting means is rotationally driven to rotate at said predetermined rate in a direction opposite to said predetermined direction in order to maintain said diverting means in a predetermined spacial location to effect a particular steering force thrust vector.

4,522,358

METHOD AND APPARATUS FOR THE DISPLACEMENT OF TWO THRUST REVERSERS OF JET ENGINES OF AN AIRCRAFT IN SYNCHRONISM DURING THE THRUST REVERSAL PHASE

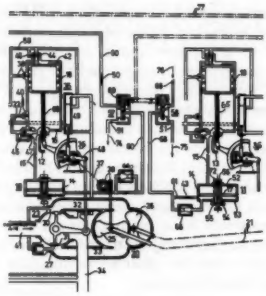
Hans Dinger, Friedrichshafen; Hilbert Holzhauer, Stetten, and Erberhard Lang, Grafelfing, all of Fed. Rep. of Germany, assignors to MTU, Munich, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,695

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222672

Int. Cl.³ F02K *1/60*

U.S. Cl. 244—110 B **27 Claims**



1. In a system for the displacement of two thrust reversers for two jet engines of an airplane, each thrust reverser having a drive motor operated by compressed air, a valve controlling the flow of compressed air to the motor, set-point indicator means including an input piston controllable by the action of compressed air, a differential transmission, and a feedback system from said motor to said differential transmission, said valve being actuated by said input piston and said motor via said differential transmission, the improvement comprising means for interrupting the displacement of one of said thrust reversers at an intermediate point in the path of travel thereof in the event that said one thrust reverser reaches said intermediate point before the other thrust reverser reaches a corresponding intermediate point in its path of travel, and means for eliminating such interruption of the displacement only when both of the thrust reversers have reached their respective said intermediate points in their paths of travel whereafter the thrust reversers simultaneously commence travel through the remainder of their paths of travel.

4,522,359

DOOR ANTI-HIJACKING LATCH/LOCK MECHANISM WITH PNEUMATIC DECOMPRESSION OVERRIDE

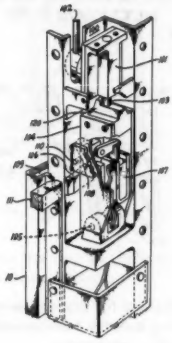
Royce F. Church, Lynnwood; Donald B. McCaffrey, Edmonds, and Leo W. Plude, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 444,245

Int. Cl.³ B64C *1/14*

U.S. Cl. 244—129.5 **4 Claims**

1. An aircraft door anti-hijacking latch lock mechanism having means for providing pneumatic decompression override, said latch lock mechanism having an engaged mode only in response to application of electrical power, said latch lock mechanism further operative in a release mode in response to switch actuation on a pilot panel, loss of electrical power, or key actuation from outside the control cabin of the aircraft



wherein said means for providing pneumatic decompression override includes a spring returned striker and spring loaded ball detent arrangement.

4,522,360

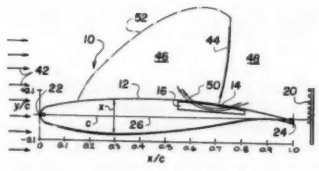
PASSIVE DRAG CONTROL OF AIRFOILS AT TRANSONIC SPEEDS

Richard Barnwell, Newport News; Dennis Bushnell, Wicomico, both of Va.; Henry T. Nagamatsu, Schenectady; Lakhdar Bahi, Troy, both of N.Y., and Janet Ross, Burbank, Calif., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Apr. 27, 1983, Ser. No. 489,056

Int. Cl.³ B64C *21/08*

U.S. Cl. 244—204 **13 Claims**



1. An airfoil for transonic speeds having a leading edge and comprising a porous top surface area extending from a location at about 50 to 60% of a chord length from the leading edge, to a location at about 80 to 90% of the chord length from the leading edge, and passive means defining a cavity under said porous top surface area and in the airfoil having a depth of from 0.05 to 0.2% the chord length.

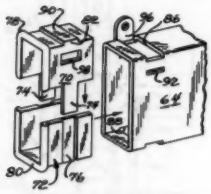
9. A passive method of reducing drag of an airfoil at transonic speeds comprising providing a porous surface area on the airfoil extending as close as 50% of a chord length from a leading edge of the airfoil to as far as 90% of the chord length from the leading edge of the airfoil, and defining a cavity below the porous surface area for passing air from a high pressure area downstream of a pressure wave established on the airfoil during transonic speeds, to a low pressure area upstream of the shock wave and not elsewhere.

4,522,361

LOCKING SPREADER LEG FOR TRIPOD

Paul C. Mooney, c/o Quick Set, Inc., 3650 Woodhead Dr., Northbrook, Ill. 60062

Filed Nov. 18, 1982, Ser. No. 442,852
Int. Cl.³ A47B 91/00
U.S. Cl. 248—188.8 12 Claims



1. A locking mechanism for first and second telescoping leg members, said first leg member telescopically received within said second leg member, comprising:

first and second clamps within and longitudinally fixed with respect to said second leg member, said first leg member being received between said first and second clamps; and

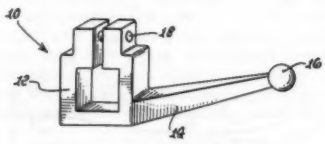
means associated with said clamps for selectively either releasing said clamps to allow relative longitudinal motion of said leg members, or biasing said clamps together into frictional contact around said first leg member to prevent relative longitudinal motion of said leg members.

4,522,362

SUPPORT DEVICE PARTICULARLY USEFUL FOR DRAFTING TEMPLATES AND THE LIKE

Kelly Owen, 79 Hunter Point Rd., Pomona, Calif. 91766

Filed Aug. 19, 1983, Ser. No. 524,647
Int. Cl.³ A47F 7/00
U.S. Cl. 248—207 6 Claims



1. A support device particularly useful for holding drafting templates and the like in a condition readily accessible to a draftsman, the support device comprising:

an integral base member having a substantially rectangular cross-section disposed with respect to X, Y, and Z orthogonal axes, said axes having a point of intersection with respect to one another; said base member being oriented with its center at the intersection of said X, Y, and Z orthogonal axes;

means for adjustably fastening said base member to said support device said means provided at an upper side portion of said base member; and

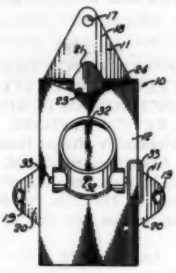
a substantially linear post extending outwardly from a lower side portion of said base member, said post being angled in a range of from about 5° to about 45° with respect to said X axis and said post being angled in a range of from about 5° to about 45° with respect to said Z axis.

4,522,363

GRAVITY SELF-ALIGNING ARTICLE MOUNT

Clifton F. Stuart, Rte. 1, Box 137, Lynnville, Tenn. 38472

Filed Aug. 19, 1982, Ser. No. 409,441
Int. Cl.³ F16B 3/08
U.S. Cl. 248—225.2 8 Claims



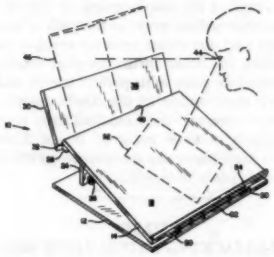
1. In an article mount for suspension mounting of an article to a support, including, a first mounting bracket adapted for securement to a support and a second mounting bracket adapted for securement to an article to be suspended from said support and for mating suspension engagement with said first bracket, a vertically extending horn secured to upper portions of one of the brackets and an opening in upper portions of the other of said brackets for receiving and seating the horn to hang the article bracket from the support bracket, the improvement comprising, said brackets having engaging body portions which underly said horn and opening and which body portions further respectively have mating convex and concave contoured seating surfaces adapted to gravitationally self-align one of said brackets with the other to vertical after said horn has been engaged in said opening.

4,522,364

DESK TOP

Gregory S. Charney, 605 NE. Liberty, Portland, Oreg. 97211, and Terrance D. Hohner, 1090 SW. Gaines, Portland, Oreg. 97201

Filed Mar. 3, 1983, Ser. No. 471,857
Int. Cl.³ F16F 15/00
U.S. Cl. 248—460 4 Claims



1. A portable desk top adapted to rest on a support surface comprising; a first platform having a top surface and an upper edge, a first foldable support means for the first platform having an open position for supporting the first platform with the top surface inclined front to back relative to the support surface, a second platform having a top surface, and a second foldable support means supporting the second platform at the upper edge of the first platform with the top surface of the second platform inclined at a determined angle front to back

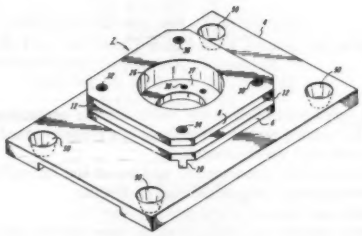
relative to the top surface of the first platform, said second foldable support means comprised of a pivotal connecting means forming a pivotal juncture between the lower end of the second platform and the upper edge of the first platform, and further comprised of a stop positioned on one of the first and second platforms in the path of the relative pivoting movement of the other of the platforms to abuttingly engage said other of the platforms and thereby to limit rearward pivoting of the second platform at the determined angle relative to the first platform, said stop comprising the sole support of the second platform at the determine angle, said second foldable support means further including a raised strip on the bottom of the second platform, and said pivotal connecting means forming a pivotal juncture between the raised portion of the strip and the upper edge of the first platform whereby in the open position the top surface of the second platform is offset rearwardly from the top surface of the first platform thereby forming a book supporting ledge, and said second foldable support means permitting the pivoting forwardly of the second platform to fold the top surface thereof onto the top surface of the first platform for carrying.

4,522,365

DUAL-AXIS POSITIONING APPARATUS ADJUSTING THE ANGULAR POSITION OF AN OPTICAL ELEMENT

Gilbert Tabares, Playa del Rey, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 18, 1983, Ser. No. 467,638
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—466 **2 Claims**



1. A positioning apparatus of unitary construction comprising first, second and third generally planar members with the second member between the first and third members, a first pair of rigid connecting sections rigidly linking first and second oppositely disposed portions of a first of said planar members to a second of said planar members, a second pair of rigid connecting sections rigidly linking other oppositely disposed portions of said first of said planar members to a third of said planar members, and means for moving portions of one of said planar members relative to the other of said planar members and for moving other portions of said one of said planar members relative to only one of said planar members.

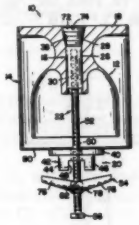
4,522,366

VASE LOCKING DEVICE

George B. Howell, III, 1036 S. Sterling, Tampa, Fla. 33609

Filed Aug. 3, 1983, Ser. No. 519,844
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—551 **7 Claims**

1. A vase locking device for use with a grave or monument to alternately secure a combination vase and base in either the stored or upright position comprising an adaptor apparatus coupled to the vase including a first and second adaptor element and a lower lock member comprising a base member having a locking element affixed to one surface thereof (coupled to the base selectively coupled together), the base selectively secured to the vase by an interconnecting member extending between said lower lock member and said first or second adaptor element such that said vase locking device secures the vase to the base in the stored position with said first



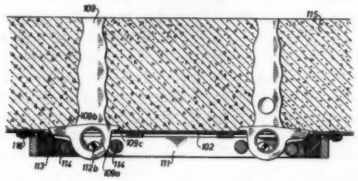
adaptor element and the vase and base in the upright position with said second adaptor member.

4,522,367

MATRIX ARRAY FOR MANUFACTURING CONCRETE SLEEPER BLOCKS

Stig Thim, Växjö , Sweden, assignor to A-Betong AB and Sabema Material AB, both of Växjö , Sweden

Division of Ser. No. 475,661, Mar. 15, 1983, Pat. No. 4,495,127.
This application Sep. 12, 1984, Ser. No. 649,861
Claims priority, application Italy, Jul. 9, 1982, 22322 A/82
Int. Cl.³ B28B *23/06*
U.S. Cl. 249—86 **3 Claims**



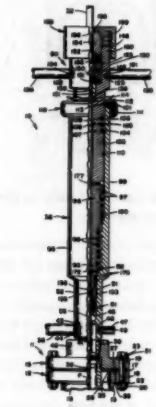
1. A matrix array for manufacturing concrete sleeper blocks (**115**) for a railway switching-point comprising a plurality of separate matrices having the form of substantially planar discs or plates (**102**) of substantially the same width as the upper surface of the sleeper blocks and having varying lengths corresponding to the desired lengths of individual sleeper blocks, and being provided with holes (**102*a***) arranged at predetermined varying locations for detachably mounting attachment means (**109**) intended to be cast in the sleeper blocks, characterized in that the attachment means are detachably mounted in accurately predetermined positions in frame members (**111**) affixed to the discs, said attachment means having parts provided with bores or holes (**109*a***) outside of the cast sleeper blocks, and, before the casting operation, being detachably mounted to the frame members by elongated securing members (**112**) having a longitudinal crank-shaft profile, said securing members extending through the bores or holes in said parts and through opposite holes (**111*a***) in said frame members to secure the attachment means, and said frame members upon casting and hardening of the sleeper blocks being detachable from the discs and the in-cast attachment means for renewed use.

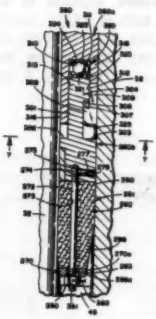
4,522,368

CLOSURE DEVICE

Donald E. Sable, 4100 Spring Valley Rd. #900, Dallas, Tex. 75240

Filed Dec. 19, 1983, Ser. No. 562,821
Int. Cl.³ E21B *33/02*
U.S. Cl. 251—1 B 6 Claims





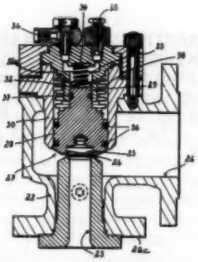
1. A closure device for a well head having a substantially vertical flow conductor extending into a well bore and an elongate member extending longitudinally into said vertical flow conductor, said closure device including: a tubular main body connectible to said well head in axial alignment with the vertical flow conductor for and with the elongate member to extend therethrough into the well head and the well flow conductor, said main body having lateral port means above the well head and a seal seat above said port means; a tubular operator ram telescoped downward in said main body and extending toward said seal seat, annular compressible seal means mounted on said operator ram engageable with said seal seat upon downward movement of said operator ram in said main body and compressible between said operator ram and said seal seat for engaging and sealing between the elongate member and said main body while the elongate member is stationary when said operator ram is moved downwardly in said main body toward said seal seat; co-engageable means on said operator ram and said main body above said seal seat for moving said operator ram longitudinally in said main body upon rotation of said operator ram relative to said main body, first seal means disposed above said seal seat for sealing between said operator ram and said main body; and second seal means disposed above said compressible seal means for sealing between the elongate member and said operator ram, said first seal means comprising a plurality of longitudinally spaced independent seal means, said co-engageable means being disposed between said seal seat and said first seal means, said operator ram comprising an upper section and a lower section connected rotatably to said upper section, one of said upper sections and said lower section having a purality of collet fingers, the other of said sections having a lock flange, and co-engageable latch means for limiting upward movement of said upper section relative to said lower section while permitting rotational movement of said upper section relative to said lower section.

4,522,369

PILOT-CONTROLLED SAFETY VALVE

André Gemignani, Avenue Allende,, Martigue (Bouches-du-Rhone), France

Filed Aug. 16, 1983, Ser. No. 523,696
Claims priority, application France, Aug. 17, 1982, 82 14491
Int. Cl.³ F16K *31/126*
U.S. Cl. 251—61.5 5 Claims



1. A pilot-controlled safety valve for the protection of a vessel by venting pressure therefrom at a predetermined maximum level, said valve comprising:

a valve housing connected to said vessel and formed with a valve passage communicating therewith;

a valve seat formed along said passage;

a valve member movable along an axis toward and away from said seat for selectively blocking and unblocking said passage;

a support element carrying said valve member and guided in said housing for movement along said axis;

a metal bellows sealingly connected to said support element and to said housing, said support element forming a command chamber with said housing; and

means connecting said command chamber to said vessel, thereby enabling the displacement of said support element and said valve member, said support element being stepped and having a large section turned toward said seat and a small section turned away from said seat, said housing having a pair of sleeves each axially guiding one of said sections, said bellows being received between said sleeves.

4,522,370

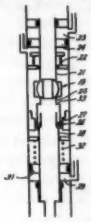
VALVE

Timothy J. Noack, Lewisville, Tex., and Lester C. Rathie, Dartmouth, Canada, assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed Oct. 27, 1982, Ser. No. 437,172
Int. Cl.³ F16K *31/143*
U.S. Cl. 251—63.5 9 Claims

1. A lubricator-retainer valve comprising, a body having a flowway therethrough, a cooperative valve member and seat controlling flow through the flowway, said valve member movable along said flowway, means for moving said valve

member between open and closed positions including a first pressure responsive member exposed to pressure fluid from a control line connector, a two-position mandrel means movable between a first position in which the valve member is in closed position and a second position in which the valve member is in open position, said mandrel means engaging and preventing movement of said valve member from closed to open position when in said first position, and pressure responsive latch means



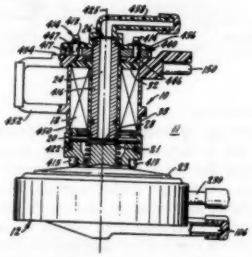
including a second pressure responsive member exposed to a second pressure fluid from a lock connector releasably latching the mandrel means to said housing in said first position in response to pressure applied to said second pressure responsive member, said mandrel means arranged such that when latched to said housing any force applied to move said valve member toward open position places said mandrel means in compression.

4,522,371

PROPORTIONAL SOLENOID VALVE

Clarence D. Fox, and Tibor Baron, both of Decatur, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 20, 1983, Ser. No. 506,138
Int. Cl.³ F16K *31/06*
U.S. Cl. 251—139 **5 Claims**



1. An electromagnetic valve assembly having a first member of magnetic material with a top and a bottom;

a top member of magnetic material, affixed near the top of the first member;

a center member of magnetic material extending through said top member;

a seat extending beyond the center member;

a base member, attached to the bottom of the first member, to define a chamber adjacent the seat;

a magnetic closure member, positioned within the chamber at a predetermined distance from said seat which, with the first member, the top member and the center member, completes a flux path including an air gap defined between the magnetic closure member and the center member; and

means for establishing the flow of electromagnetic flux through said flux path;

said first member defines an extension extending above said top member, said top member having at least two portions, at least one of said top member portions being movable relative to said other portion, and defining an aperture to receive said extension and a channel to receive a securing means;

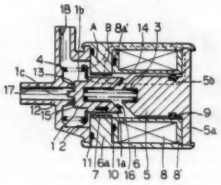
wherein said movable portion is movable about said extension to vary the reluctance in the electromagnetic flux path.

4,522,372

ELECTROMAGNETIC VALVE

Kiyotoshi Yano, Aki; Yutaka Suzuki, Nishio, and Yoshichika Yamada, Kuwana, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 21, 1983, Ser. No. 554,108
Claims priority, application Japan, Jan. 18, 1983, 58-7089
Int. Cl.³ F16K *31/06*
U.S. Cl. 251—141 **2 Claims**



1. An electromagnetic valve having a single coil through which an electric current is applied, a yoke encasing said coil, a stator core positioned in said coil for passing the magnetic flux generated by said coil therethrough, a moving core positioned in the vicinity of said stator core for passing said magnetic flux therethrough to be moved in response to said electric current applied to said coil, and a fluid passage with an inlet port and an outlet port to be controlled by the movement of said moving core, further comprising:

first means through which said magnetic flux generated by said coil with a first level of current passes for moving said moving core to a first position, and

second means through which the magnetic flux generated by said coil with a second level of current passes as a primary passage for moving said moving core to a second position,

wherein said moving core controls said fluid passage to a first cross-sectional area in said first position, and to a second cross-sectional area in said second position, and

wherein said first means includes a moving plate carried by said moving core and positioned apart from a shoulder of said yoke when said coil is not energized, and said second means includes a sleeve positioned between said shoulder and said moving core, such that said moving plate moves to contact said shoulder, pushing said moving core to said first position when said first level of current is applied, and said moving core moves to said second position to be apart from said moving plate when said second level of current is applied over said sleeve.

4,522,373

VALVE DETENT

William C. Shelbourn; Patrick Kuhn, and Michael A. Vig, all of Bismarck, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Sep. 6, 1983, Ser. No. 529,241
Int. Cl.³ F16K *35/04*; F15B *13/04*
U.S. Cl. 251—297 **3 Claims**

1. A detent mechanism for a hydraulic control valve which has a valve housing having a bore therein and a multi-position spool located in said bore and movable longitudinally therein, the detent mechanism comprising,

a detent housing secured on said valve housing,

said detent housing defining an opening which is coaxial with said bore,

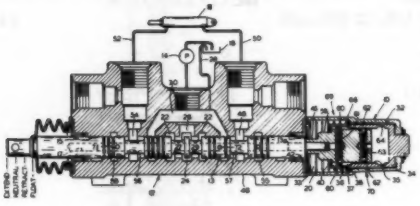
a first wall portion and a second wall portion in said detent housing and a groove in said first wall portion,

a detent spool connected to said valve spool for conjoint movement therewith and operative in said detent housing,

a first detent member carried by said detent spool and arranged to engage said groove in a detent position of said valve,

a first spring carried by said detent spool which urges said first detent member into contact with said first wall portion,

a second detent member carried by said detent spool and arranged to engage said second wall portion,



a second spring carried by said detent spool which urges said second detent member into contact with said second wall portion in at least one valve position,

a ramp on said first wall portion arranged to be engaged by said second detent member to provide increased resistance to axial movement of said valve spool as said first detent member approaches said groove at said detent position,

said second wall portion comprising a movable sleeve member which interacts with said detent spool, and

said movable sleeve member having an outwardly extending shoulder, a spring retainer, and a centering spring held between said shoulder and said spring retainer.

4,522,374

VALVE SPOOL

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to Mac Valves, Inc., Wixom, Mich.

Filed Mar. 3, 1983, Ser. No. 471,858

Int. Cl.³ F16K *11/18*

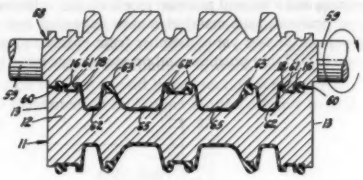
U.S. Cl. 251—356 **6 Claims**

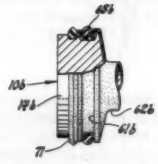
1. A sliding valve spool for an air valve characterized in that it comprises:

(a) an elongated valve spool body having an inner and an outer peripheral groove on each end thereof, and a plurality of longitudinally spaced apart integral intermediate annular valve flanges to form a one-piece construction body;

(b) said valve spool body having an integral elastomeric material molded thereon, around the periphery thereof, and said integral elastomeric material including an annular centering seal molded in one of each of said inner and outer peripheral grooves at each end of the valve body, and an annular valve member is molded around each of said plurality of integral annular valve flanges, and said molded integral elastomeric material extends around the periphery of the valve spool one-piece construction body over the other of each of said inner and outer peripheral grooves and between each of said annular centering seals and the integral annular valve members; and,

(c) each of the elastomeric annular centering seals and annular valve members are of equal diameter, and an annular pressure seal groove is formed in the molded material, at each end of the valve spool body, in the other one of each of said inner and outer peripheral grooves, and an annular





pressure seal is mounted in each annular pressure seal groove.

4,522,375

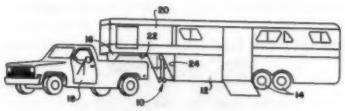
ELECTRICAL LIFT FOR TRAILERS

Carmen Howell, Rte. 1, Box 869, Owasso, Okla. 74055

Filed Dec. 27, 1982, Ser. No. 452,944

Int. Cl.³ B60S *9/02*

U.S. Cl. 254—425 **2 Claims**



1. In combination,

a trailer having opposed paralleled sidewalls and having wheels and a forwardly extending portion having the lower edge thereof of increased ground height clearance providing a vertical trailer surface forwardly of said trailer wheels and between said trailer sidewalls;

a downwardly extending fifth wheel connector type arrangement for removably coupling said trailer to a pivotal connection carried by a towing vehicle;

an elongated vertical housing affixed to the trailer vertical surface (a) rearwardly of said trailer fifth wheel connector, (b) centrally between said trailer sidewalls, and (c) forwardly of said trailer wheels;

a vertical support post member telescopically and downwardly extending from said housing, the lower end thereof being adaptable to engage the earth's surface;

a horizontal plate affixed to said vertical support post member and having a threaded opening therethrough;

a vertically externally threaded shaft received in said plate threaded opening and coaxially of said housing and said support post member;

a gear affixed to the upper end of said vertical support member whereby the gear rotates the vertical axis of the post member;

a horizontal shaft rotatably received by said housing in the upper portion thereof;

a worm gear affixed to said horizontal shaft and in engagement with said horizontal gear affixed to said vertical

threaded shaft whereby the rotation of said horizontal shaft in one direction telescopically downwardly extends said support post member to engage the earth's surface and lift said trailer forward end, and rotation of said horizontal shaft in the opposite direction upwardly withdraws and support post to lower said trailer onto a towing vehicle pivotal connection;

a second gear on said horizontal shaft;

an electric powered gear motor drive supported on said trailer vertical surface centrally between said trailer sidewalls and directly above said vertical housing, the gear motor drive having a horizontal drive shaft extending therefrom having a drive gear thereon;

a chain coupling said gear motor drive gear to said horizontal shaft second gear;

a source of electrical energy; and

reversing switch means connecting said source of electrical energy to said gear motor drive whereby said support post member may be extended or withdrawn to raise and lower the forward portion of said trailer.

4,522,376

GAS FLUSHING INLET ARRANGEMENT IN A METALLURGICAL VESSEL AND METHOD OF OPERATION OF SUCH AN ARRANGEMENT

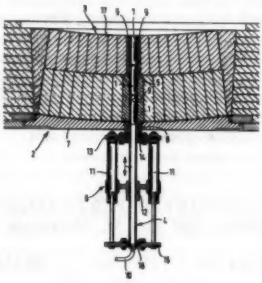
Wilhelm Langenfeld, Düsseldorf, Fed. Rep. of Germany, assignor to Didier-Werke A.G., Wiesbaden, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,419

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318422

Int. Cl.³ C21B 7/16

U.S. Cl. 266—47 **21 Claims**



1. A gas flushing inlet arrangement in the wall of a melt-containing lined metallurgical vessel for the introduction of gases into the vessel, said wall having an exterior portion and an inner portion, said arrangement including at least one gas pipe inlet member passing through said vessel wall and containing at least one gas permeable insert, wherein said arrangement includes means for selectively advancing said gas pipe inlet member slidably with respect to a longitudinal axis of said pipe insert into said vessel wall, said advancing means being mounted adjacent said exterior portion of said wall.

4,522,377

METHOD AND APPARATUS FOR PROCESSING SLAG

Frederick M. Degner, Waupaca, Wis., assignor to The Budd Company, Troy, Mich.

Filed Sep. 19, 1983, Ser. No. 533,594

Int. Cl.³ F27D 3/14

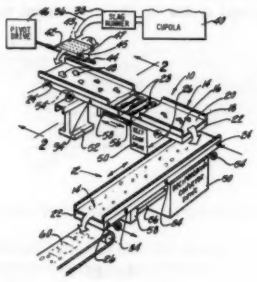
U.S. Cl. 266—196 **6 Claims**

1. Apparatus for processing a stream of molten slag, said apparatus comprising:

an elongated conveyor member having a generally flat major upper surface;

cooling means for cooling the upper surface of the member;

means for diverting the stream of molten slag onto different locations on the upper surface of the conveyor member; and



means connected to the conveyor member for imparting reciprocal lengthwise motion to the conveyor member substantially free of vertical motion thereto to thereby transport the slag over the cooled surface until the molten slag is solidified.

4,522,378

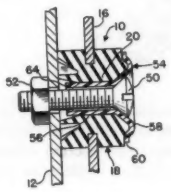
WIPER MOTOR MOUNTING GROMMET

John F. Nelson, New Lenox, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Nov. 2, 1983, Ser. No. 548,253

Int. Cl.³ F16F 7/00

U.S. Cl. 267—141.4 **3 Claims**



1. The combination of a one-piece integral resilient grommet of elastomeric material and a non-deformable spool for mounting a fractional horsepower motor or the like on a support surface in a spaced apart relation and to reduce the vibration and associated noise propagation to a negligible amount, said grommet comprising a center sleeve portion of resilient deformable material having a cylindrical center opening, a pair of spaced apart vibration dampening members integrally formed of resilient deformable material around said sleeve portion, each of said vibration dampening members having a circular end wall extending radially from said sleeve portion and an outer annular wall extending coaxially of said cylindrical center opening, a first set of radially extending ribs of resilient deformable material extending axially from one of said circular end walls between its sleeve portion and its outer annular wall, and a second set of radially extending ribs of resilient deformable material extending axially from the other of said circular end walls between its sleeve portion and its outer annular wall, where said first and second set of radially extending ribs are angularly offset in an axial direction from each other, and said non-deformable spool includes a hollow shank portion with an outer diameter slightly smaller than said cylindrical center opening and a head portion having a central aperture the size

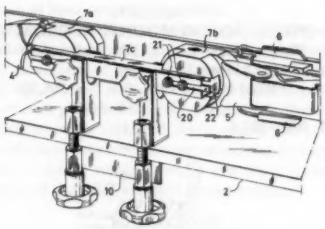
of said outer diameter for said hollow shank portion, and the other end face of said resilient grommet being shaped to conform to the underside of said head portion of said spool such that said head portion engages substantially the entire surface area of said other end face and where said circular end wall of said pair of spaced apart vibration dampening members are separated by a selected distance to define an annular recess for mounting said motor or like component to be vibrationally isolated.

4,522,379

SKI HOLDER

Erik V. Lindgren, P1 1101, S-790 15 Sundborn, Sweden

Filed Feb. 22, 1983, Ser. No. 468,690
Claims priority, application Sweden, Feb. 23, 1982, 8201125
Int. Cl.³ B25B *1/20*
U.S. Cl. 269—47 **5 Claims**



1. A holder for attaching skis having a binding including a ski-stopper mechanism to a stationary support, comprising:

(a) a ski boot dummy to be inserted into the binding correspondingly as a ski boot while retracting the ski stopper mechanism,

(b) a holder part having means for attachment to said support and means for removably securing said ski boot dummy to said holder part,

said means for attaching said ski boot dummy to said holder part permitting attachment of the dummy in a first position, in which the bottom side of the ski is turned upwards, and second and third positions, in which either of the side edges of the ski are turned upwards; wherein said ski boot dummy comprises

(i) a front part corresponding to the toe portion of a ski boot,

(ii) a rear part corresponding to the heel portion of a ski boot, and

(iii) an intermediate part interconnecting said front part with said rear part, said intermediate part being arranged to be removably attached to said holder part;

(wherein at least one of said front and rear parts can be displaced along said intermediate part and can be secured thereto in positions corresponding to the desired binding size;

wherein said intermediate part is provided with longitudinal slots at at least one end thereof; and

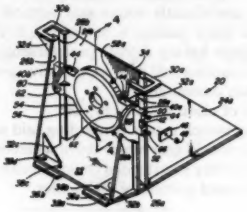
wherein the corresponding front or rear part can be removably secured to said intermediate part by means of elongate fastening means extending through said longitudinal slots.

4,522,380

ADJUSTABLE JIG ASSEMBLY

Darren C. Peddle, Lower Sackville, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Sep. 6, 1983, Ser. No. 529,639
Claims priority, application Canada, Oct. 27, 1982, 414249
Int. Cl.³ B23Q *1/04*
U.S. Cl. 269—71 **11 Claims**



1. An adjustable jig assembly for holding a workpiece in a desired position, comprising

a stand having wall members defining a pair of opposed substantially vertically extending slide channels;

mounting means slidable in said slide channels and adapted to be secured at desired positions therealong;

a housing for retaining a work piece engaging member, said housing extending between and mounted on said mounting means for rotation about a first axis and being adapted to be secured to said mounting means in desired angular positions about said axis, said housing including a collar section having threaded bores therein; and

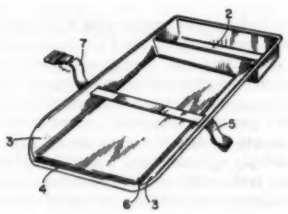
a disc-shaped work piece engaging member adapted to be attached to a work piece, said member being mounted in said collar section for rotation about a second axis normal to said first axis, and threaded members engageable with said threaded bores and the circumference of said member for securing said work piece engaging member in desired angular positions about said second axis.

4,522,381

ONE PIECE SANITARY DIAPER CHANGING STATION

Lanny E. Ludwick, 1005 12th St., Huntington Beach, Calif. 92648

Filed Jun. 17, 1983, Ser. No. 505,454
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—328 **2 Claims**



1. A one piece sanitary diaper changing device for use in changing the diapers or other clothing of an infant comprising:

a rigid one piece container having two sections one of the sections having a rectangular flat surface and on two opposite sides sidewalls both sidewalls of sufficient height and at an angle to prevent the infant from rolling or sliding over the edge of the device, the sides of the rectangular flat surface not having the sidewalls have a raised edge that joins with

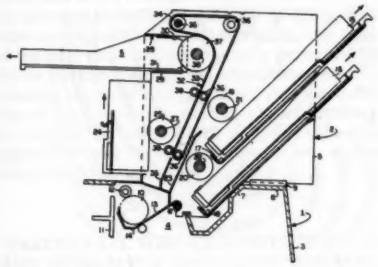
the sidewalls to form a seal to contain liquids on the rectangular flat surface, the other section, is located on one of the sides of the rectangular flat surface not having the sidewalls and has a compartment integrally formed as part of the container; a pad covering the rectangular flat surface; a safety strap located across the rectangular flat surface.

4,522,382

SHEET AND ENVELOPE FEED APPARATUS FOR A PRINTER AND ASSOCIATED METHODS

Mosi Chu, Setauket, and Meng S. Kuo, Ponkonkoma, both of N.Y., assignors to Primages, Inc., Bohemia, N.Y.

Filed Nov. 23, 1983, Ser. No. 555,116
Int. Cl.³ B41F *13/54*
U.S. Cl. 270—1.1 **29 Claims**



1. Sheet feeder apparatus for a printer comprising a first tray for first sheets of paper, a first drive means for feeding sheets of paper from the first tray to the printer where a printing operation is effected on at least one of the faces of the sheets of paper, a second tray for further sheets of paper, a second drive means for feeding the sheets of paper from the second tray to the printer where a printing operation is effected on at least one of the faces of the further sheets of paper, a third tray for envelopes, a third drive means for feeding envelopes from the third tray to the printer where a printing operation is effected on the faces of the envelopes, the first, second and third drive means being driven to feed the sheets of paper and envelopes to the printer in successive groups each consisting of an envelope and sheets of paper representing an item of correspondence, and conveyor means for receiving the sheets of paper and the envelopes in successive groups from the printer and delivering the printed sheets of paper and envelopes to a stacking station at which the printed sheets of paper and printed envelopes are stacked one after the other successively in the order printed and wherein the printed face of each sheet of paper faces away from the next successive sheet of paper whereby the sheets of paper for each item of correspondence are collated in sequential order of printing.

4,522,383

RECIPROCATING STITCHER ASSEMBLY

Keith S. Macey, Rocky River, Ohio, assignor to K. S. Macey Machine Company, Inc., Cleveland, Ohio

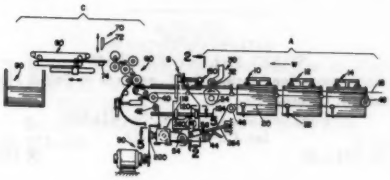
Continuation-in-part of Ser. No. 381,529, May 4, 1982, Pat. No. 4,479,642, which is a continuation-in-part of Ser. No. 364,225, Apr. 1, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 427,671
Int. Cl.³ B42B *1/02*
U.S. Cl. 270—53 **41 Claims**

1. A method of binding stacks of sheets, the method comprising the steps of:

continuously conveying the stacks longitudinally at regular intervals along a workpath;

cyclically reciprocating at least one stitcher head and clincher longitudinally of the workpath in coordination with the conveying of the stacks, each reciprocation cycle occurring in the same time as the stacks advance by said regular interval;

during a portion of each reciprocation cycle, carrying each stack in a preselected relationship with the stitcher head and clincher such that the regular interval between the



carried stack and the other stacks is temporarily disrupted; and,

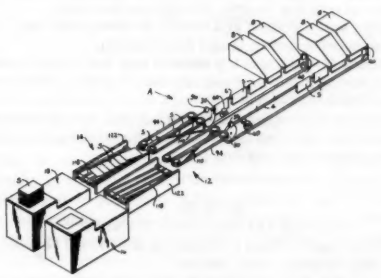
actuating the stitcher head and clincher during said reciprocation cycle portion at the same point in each reciprocation cycle, such that the stacks are stitched at substantially the same areas thereof.

4,522,384

MACHINE FOR COLLATING SIGNATURES IN THE SADDLE FORMAT

Robert A. Beckley, Mount Vernon, Ill., assignor to World Color Press, Inc., Effingham, Ill.

Filed Sep. 30, 1983, Ser. No. 537,865
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **20 Claims**



1. A machine for collating signatures in a saddle format, said machine comprising: first and second endless gathering chains located side-by-side and parallel to each other and having feed and discharge ends, the first gathering chain being longer than the second gathering chain so that the feed end of the first chain is located beyond the feed end of the second chain; at least two feeding means located in succession along each gathering chain for depositing signatures on the chains such that the folds of the signatures are along the upper portions of the chains and the pages on each side of the folds drape downwardly along the sides of the chains, whereby that the signatures as they move along the chains are in a vertical position, the first feeding means in the succession along each chain depositing its signatures directly on the chain and each subsequent feeding means in the succession depositing its signatures on the signatures deposited by the feeding means immediately ahead of it in the succession, the feeding means for the first chain being located ahead of the feed end of the second gathering chain as well as ahead of the feeding means for the second chain; layup means located immediately beyond the discharge ends of the first and second gathering chains for turning the compiled signatures from a substantially vertical to a substantially horizontal position and for discharging the compiled signatures in first and second rows in a substantially horizontal

position; a shingling conveyor located beyond the layup means for receiving the two rows of compiled signatures discharged from the layup means and for further arranging those compiled signatures in a shingled condition, likewise in first and second rows; and first and second stacking means for converting the first and second shingled rows of compiled signatures into stacks.

4,522,385

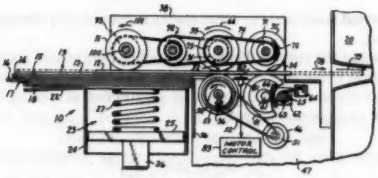
SHEET FEEDER SYSTEMS

Rafn Stefansson, San Marino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 22, 1982, Ser. No. 421,655

Int. Cl.³ B65H *3/52*

U.S. Cl. 271—10 **20 Claims**



1. In a method of transporting sheets from a stack, the improvement comprising in combination the steps of:

advancing from said stack each top sheet in turn to a first location;

rejecting at said first location any adjacent sheet moving along with said top sheet from said stack;

providing driving means for driving said advancing top sheet at said first location away from the stack;

engaging said top sheet at a second location while said top sheet is being driven at said first location;

continuing to drive said top sheet at said first location with said driving means until said top sheet has been driven past said first location; and

accelerating said engaged top sheet at said second location away from said first location only after said top sheet has been driven past said first location.

4,522,386

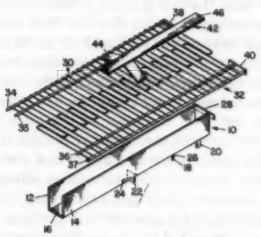
PAPER FEEDING MECHANISM

Bruce Brown, and William C. Brown, both of 926-C N. Maclay Ave., San Fernando, Calif. 91340

Filed Jun. 10, 1983, Ser. No. 503,494

Int. Cl.³ B65H *1/08*

U.S. Cl. 271—147 **5 Claims**



1. An adjustable paper feeding device for a printing press having a paper pile platform which rises to feed paper to the press and paper pile side supports, said adjustable paper feeding device comprising a concave base center support piece fixedly attached to the paper pile platform, removable and adjustable left and right interlocking grills resting on the concave base center support and frictionally attached by means integral with the grills to the paper pile side supports, a flexible rear paper pile feeding guide mounted above the paper pile platform to flex in a vertical direction as the interlocking grills rise to contact the rear paper pile feeding guide.

4,522,387

DEVICE FOR STACKING SHEET-SHAPED OBJECTS

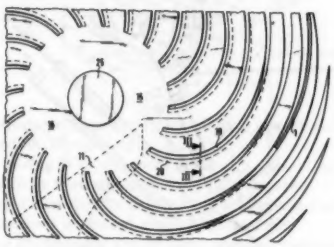
Karl Leuthold, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 521,724

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232348

Int. Cl.³ B65H *29/00*

U.S. Cl. 271—187 **6 Claims**



1. A device for stacking sheet-shaped objects, comprising: a plurality of disks arranged adjacent to each other on a driving shaft, said disks having spiral slots running from the outside towards the inside thereof, the slots of respective disks overlapping one another in an axial direction, overlapping slots together forming a pocket into which the objects may be fed singly by a transport system, at least one of said spiral slots forming each pocket being staggered relative to another of said spiral slots at least in an area of their length.

4,522,388

ARRANGEMENT FOR APPLYING COMPRESSED AIR TO UNDERSIDE OF SHEET ON FEED TABLE OF PRINTING PRESS

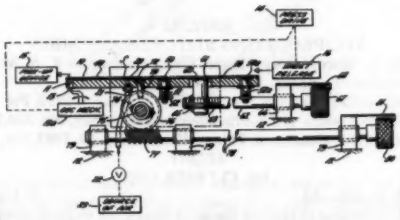
Heinrich Heine, Gutersloh; Georg Herzan, Sulzbach, and Fred Kunkel, Offenbach am Main, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 471,503, Mar. 2, 1983, abandoned. This application Jun. 30, 1983, Ser. No. 509,367

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209259

Int. Cl.³ B41F *21/12*; B65H *9/04*

U.S. Cl. 271—245 **9 Claims**



2. A sheet feeding assembly for a printing press comprising, in combination a feed table having a front edge, a set of front stops cyclically interposable at the front edge of the table, the table being longitudinally inclined downwardly in the direc-

tion of its front edge, means for releasing a sheet so that it travels towards the front edge of the table where it is temporarily retained in a registered position by the front stops, a port extending upwardly through the feed table at a position spaced from the front edge by a distance which is relatively short as compared to the length of the feed table, the port being connected to a source of compressed air, a rear feed plate seated on the feed table upstream of the port and having a front edge portion terminating in a transversely extending front edge, a front feed plate seated on the feed table downstream of the port and having a rear edge portion terminating in a transversely extending rear edge, the plates being substantially coplanar with their respective front and rear edges in proximity and uniformly spaced with respect to one another, the front edge portion of the rear feed plate being undercut to form an overhang which defines a transversely extending air conducting cavity and which overlaps the port so that air is directed from the cavity at an angle upwardly and forwardly of the table to lubricate the passing sheet and to urge the sheet in the direction of the front stops, means for varying the rate of discharge of the air through the port, and adjustable means for upwardly camming the front edge portion of the rear feed plate with respect to the feed table through a short distance so that the front edge of the rear feed plate is variably higher than the rear edge of the front feed plate thereby to vary the angle of discharge of the air against the sheet.

4,522,389

PARTICULATE SURFACE SPORTS TRACK SURFACE AND METHOD FOR RECONDITIONING SUCH TRACK SURFACE

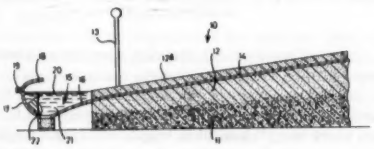
John I. Malcolm, Middleton, Nr. Tamworth, England, assignor to Coinaqua Limited, Warwick, England

Filed Aug. 16, 1982, Ser. No. 408,279

Claims priority, application United Kingdom, Aug. 18, 1981, 8125136

Int. Cl.³ A63K *1/02*

U.S. Cl. 272—4 **10 Claims**



1. A track for sporting activities having an annular inner border and a generally parallel outer border, a particulate surfacing between the inner and outer borders comprising a depth of particulate material, and a conditioning system for conditioning the surfacing, said system comprising a reservoir for liquid having inner and outer annular borders, said reservoir extending alongside one of the borders of the surfacing adjacent the surfacing, and means to cause a surge of liquid to propagate from the reservoir across and through the surfacing, said surge having sufficient energy to cause movement of the particulate material of the surfacing.

10. A method of conditioning a particulate surfacing of a track comprising the steps of:

providing a track for sporting activities having an annular inner border and a generally parallel outer border, a particulate surfacing between the inner and outer borders comprising a depth of particulate matter, and a conditioning system for conditioning the surface, said system including a reservoir for liquid having first and second annular borders, said first border of said reservoir extending alongside one of the borders of the surfacing adjacent the surfacing; and

causing a surge of liquid to propagate from the reservoir, over said first border and across and through the surfacing to move particulate matter of the surfacing in any selected portion of the entire track.

4,522,390

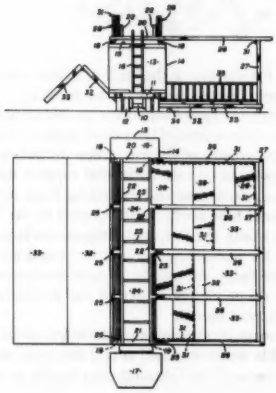
BUMPER CAR RIDE

Paul S. Kudler, New Waterford, Ohio, assignor to Majestic Rides Mfg. Co., New Waterford, Ohio

Filed May 8, 1984, Ser. No. 608,176

Int. Cl.³ A63G *1/10*; E04B *1/344*; E04H *3/10*

U.S. Cl. 272—29 **5 Claims**

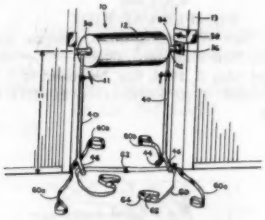


1. An improvement in a portable bumper car ride structure, said structure including a trailer having fixed floor and ceiling sections and a plurality of fold out floor sections hingedly affixed to one another and to the fixed floor section and a plurality of fold out ceiling sections hingedly affixed to one another and to said fixed ceiling section of said trailer, said floor and ceiling sections being metallic and forming electrical conductors for energizing a plurality of bumper cars positioned on said floor sections and having trolleys engaging said ceiling sections, the improvement comprising means supporting said fold out floor and ceiling sections and means for preventing the trolleys of the bumper cars from becoming disengaged from the fold out ceiling sections when the same are folded out, said portable bumper car ride structure comprising said trailer, said fixed floor and ceiling sections and said fold out floor and ceiling sections, said means supporting said fold out ceiling sections and for preventing the trolleys of the bumper cars from becoming disengaged from the fold out ceiling sections including horizontally spaced longitudinally extending trusses supporting said fixed ceiling section of said trailer, fixed support means on said trailer supporting said longitudinally extending trusses, longitudinally spaced sidewardly extending brackets on said trusses, support beams removably engaged in said brackets and positioned sidewardly of said fixed ceiling section, said ceiling sections hinged to one another in accordian fold relationship, rollers on the sides of said fold out ceiling sections movably engaging said support beams and a plurality of angularly positioned guard flanges on the respective outer free edges of said ceiling sections, said fold out ceiling sections being movable from a first vertical position between said brackets and against the outer opposite sides of said longitudinally extending trusses to a horizontal second position between said support beams.

4,522,391
EXERCISING DEVICE

George Rundall, 7701 Warner Ave., Apt. Q-231, Huntington Beach, Calif. 92647

Filed May 24, 1982, Ser. No. 381,435
Int. Cl.³ A63B 21/04
U.S. Cl. 272—62 8 Claims

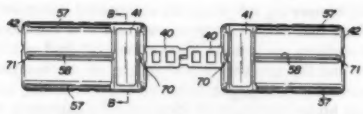


2. A device for exercising the back of a user comprising:
(a) upright support means having a base portion;
(b) horizontal support means supported on said upright support means at about the height of the pelvic region of the user for supporting the weight of the user when the pelvic region of the user is disposed on said horizontal support means; and
(c) strap means attached at and extending from substantially the level of said base portion and coupled to the feet of the user for restraining the feet, said strap means being of sufficient length for permitting the user to extend and raise his feet to substantially the height of said horizontal support means while the pelvic region of said user is disposed on said horizontal support means;
(d) said strap means comprising a single length of strap looped through buckle means attached at said base portion such that the strap means can slide through said buckle means.

4,522,392
SPRING TYPE LEG EXERCISING DEVICE

Masakatsu Torii, Saitama, Japan, assignor to Saitama Kako Co., Ltd., Japan

Filed Aug. 16, 1982, Ser. No. 408,154
Int. Cl.³ A63B 21/02
U.S. Cl. 272—142 8 Claims

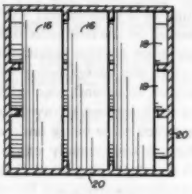


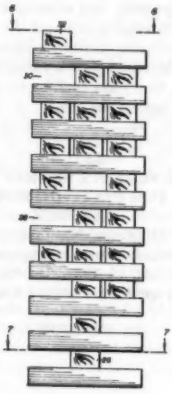
1. A physical exercise device comprising central connecting means for connecting a pair of base frame members together, said pair of base frame members having the same construction and symmetrically connected to the opposite sides of said central connecting means, a pair of foot boards symmetrically mounted on top of said respective base frames said connecting means connecting the frames so that said foot boards may be reciprocated in paths that are parallel to each other or in line with each other; and spring means connected between each associated base frame and the associated foot board, and each said spring means biasing each associated foot board in a direction opposite to the direction in which a user's efforts has forced the foot board being acted upon.

4,522,393
CENTER OF GRAVITY BLOCK REMOVAL, APPRAISAL AND BALANCING GAME

Richard A. Dunn, 42 Olympia St., Clifton, N.J. 07011

Filed Sep. 16, 1983, Ser. No. 532,687
Int. Cl.³ A63F 9/00
U.S. Cl. 273—1 GF 2 Claims





1. A center of gravity block removal, appraisal and balancing game structure, comprising:
(a) a sixteen level stack of horizontal odd and even levels consisting of elongate solid rectangular platform blocks, each block being identical in length, width and height to every other block, said blocks being approximately three (3) by three-quarters (¾) by one-half (½) inch, in which said odd numbered levels of said stack comprise three parallel rows having their lengths precisely aligned and defining, by said odd numbered levels, a first plurality of horizontal planes, and said even numbered levels of said stack comprise three parallel rows having their lengths precisely aligned and defining, by said even numbered levels, a second plurality of horizontal planes in which the rows of said even levels are precisely orthogonal to the rows of said odd levels and are horizontally and vertically balanced upon and between the rows of said odd levels;
(b) the material of said platform blocks having a weight and coefficient of sliding friction permitting the disengagement of the individual blocks from one level and the inter-engagement of said blocks onto a higher level;
(c) the ratio of the original height of the sixteen level stack to the length of a row of a level of the stack being at least two-to-one; and
(d) means for quick initial assembly of said sixteen level stack comprising a solid rectangular rack made of a transparent material having internal grooves for the acceptance, guidance and arrangement of said platform blocks into the initial sixteen level criss-crossed stack configuration defined above, wherein said rack may further function as a

storage container and carrying case for the game structure;

whereby said elongate blocks may be singularly and successively removed from any one level and then placed onto a new level and row, thereby forming a new level every third move, on top of the previous uppermost level of the stack, this process alternately continuing by alternate players until one player is eliminated by reason of his induction of the collapse of the stack.

2. The method of playing a balancing game, comprising the steps of:

(a) forming a sixteen level, criss-crossed stack of horizontal odd and even levels, said levels consisting of rows of parallel, elongate, planar solid rectangular blocks, employing a rack having a plurality of alignment grooves in order to quickly and conveniently set up said sixteen level, criss-crossed stack;

(b) disengaging one of said elongate blocks from said stack using only the fingers of one hand;

(c) placing said one block in a new level on top of the previous uppermost level of the stack, again using only the fingers of one hand; and

(d) repeating steps (b) and (c) above, starting new levels when and only when a prior level has been completed, these sets of steps (b) and (c) alternately continuing by alternate players until one player is eliminated by reason of his induction of the collapse of the stack.

4,522,394

COLLAPSIBLE, MOVABLE APPARATUS FOR SUPPORTING HEALTH-SPORTS DEVICES

Alphe Broussard, 64 Avenue Mohamed Diouri, Kenitra, Morocco

Filed Jun. 27, 1984, Ser. No. 624,954
Int. Cl.³ A63B *63/08, 69/22*
U.S. Cl. 273—1.5 R **9 Claims**

1. Collapsible, movable apparatus for containing health-sports devices and equipment comprising:

(a) a telescoping post support having at least two telescoping segments;

(b) means for moving each of the adjacent telescoping segments in relation to each other;

(c) support means adopted to fit slidably on the top telescoping segment without overlapping onto the next telescoping segment;

(d) a large horizontally-positioned ring mounted on support means (c);

(e) a platform pivotally mounted under the ring so as to be able to swing downwardly when unconnected from the ring; and

(f) a basket ball backboard vertically mounted to the top portion of the top telescoping segment, the bottom end of the telescoping post being adapted to fit into a tube positioned in the ground or other horizontal surface.

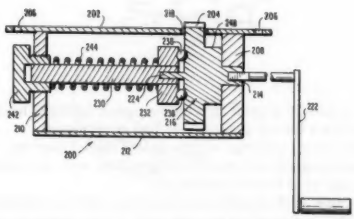
9. A brake winch comprising:

(a) a casing which includes a first end, a second end, and a side cover which contains an opening therein near said first end of said casing, said first end having a central aperture and said second end having a central aperture;

(b) gear means positioned within said casing having a shaft rotatably positioned in said aperture of said first end of said casing, said gear means having a cylindrical shape and having teeth around the perimeter thereof, said teeth of said gear means being of sufficient length so as to substantially protrude through said opening in said side cover of said casing, a short central rod being positioned on the flat side of said gear means, facing said second end of said casing, a plurality of small indentations in said flat face of said gear means facing the second end of said casing and being located equidistant from each other on a circular line having said central rod as its center point;

(c) a cap threadingly positioned in the said aperture of said second end of second casing, of said cap having a hole in the inner-facing portion therein;

(d) a hollow shaft fixedly positioned on one end in said hollow portion of said cap and fitting over said short central rod of said gear means facing said end of said casing in such a manner that said hollow shaft is rotatable in relationship to said short shaft, the bottom portion of hollow shaft being an extended rim, a plurality of small indentations in said flat face of said extended rim of said hollow shaft and being the identical number to said small indentations in said flat surface of said gear means;



(e) a spring being located around hollow shaft between said extended rim of said hollow shaft and the bottom surface of said cap means, said spring pressing said rim against said gear means when said cap means is turned inwardly; and

(f) a plurality of ball bearings or other spheroid objects positioned each of said sets of small indentations, said ball bearings serving to lock said gear means in place and to serve as a brake on the turning of said gear means, a hole being located in the extended surface of said portion of said gear means which rotatably fits in said first end of said case, to facilitate the insertion of a handle for the turning of said gear means.

4,522,395

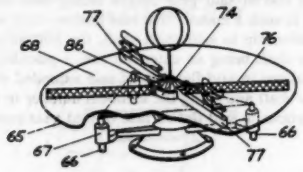
GAMES APPARATUS

Guenter Arndt, 511 Main Rd., Orewa, New Zealand

Continuation of Ser. No. 169,914, Jul. 17, 1980, abandoned. This application Feb. 3, 1984, Ser. No. 576,178
Claims priority, application New Zealand, Jul. 19, 1979, 191056
Int. Cl.³ A63B *67/18*
U.S. Cl. 273—30 **7 Claims**

6. Games apparatus of the type wherein one or more players project a ball with a racquet, bat, or the like, comprising, a

planar games playing surface defining a playing area on and above said surface; means supporting said playing surface above the ground; a rototable hub projecting vertically upwards from the geometric center of said playing surface; means



to rotate said hub; and net means mounted on said hub for rotation therewith, said net means extending above and across said playing surface in a plane substantially perpendicular to said playing surface.

4,522,396

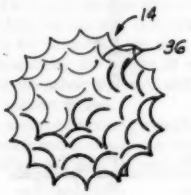
GAME BALL

Thomas L. Girard, Pratt, Kans., and Monty D. Lewis, Greeley, Colo., assignors to Indoor Activities Unlimited, Pratt, Kans.

Filed Oct. 6, 1983, Ser. No. 539,530

Int. Cl.³ A63B *37/12*

U.S. Cl. 273—58 K **3 Claims**



1. A ball for a game in which a player attempts to strike said ball with a hitting device, said ball comprising:

a low mass material weighing less than 2 ounces;

a substantially spherical configuration with an outside diameter of at least 2 inches; and

an outer surface defining a plurality of interconnecting concave indentations therein, each of said indentations having a width on said surface of at least ½ inch.

4,522,397

FILLED SHELL BOWLING BALL

Charles M. Miller, Jr., and Samuel J. Orlando, both of San Antonio, Tex., assignors to Columbia Industries, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 106,749, Dec. 26, 1979, Pat. No. 4,328,967. This application Jan. 29, 1982, Ser. No. 344,187

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ A63B *37/14*

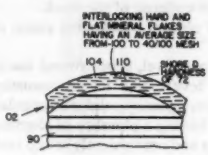
U.S. Cl. 273—63 D **13 Claims**

1. A bowling ball having high performance particles substantially uniformly distributed throughout the outer layer and upon the surface of said ball:

said particles being armored particles and being hard and inflexible as compared to the substrate of said ball's outer layer, most of said armored particles being long and thin and having a long side at least ten times longer than said thin side is wide

some of said armored particles being located at or just below said outer surface to form a substantially continuous armored layer about said ball causing said ball to have an appreciably greater resistance to penetration by a Shore D Hardness test needle than a bowling ball of identical composition to the claimed ball but without said armored layer,

said armored particles being sufficiently small and of sufficient type to allow said ball to roll upon a bowling lane without appreciable discontinuities in forward motion and without appreciable damage to said bowling lane,



said armored particles being sufficiently numerous and large to cause an increase in the surface hardness of said ball as measured by a Shore D Hardness Tester by at least one percent above the surface hardness of a bowling ball of identical composition to the claimed ball but without said armored particles.

4,522,398

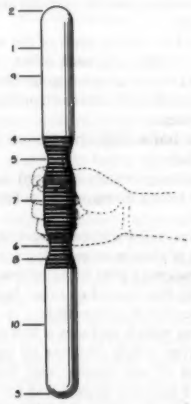
POLICE BATON

Franklin J. Swartz, 89 State St., 9th Floor, Boston, Mass. 02109, and Alex Anatolev, 645 Beacon St., Boston, Mass. 02215

Filed Feb. 4, 1983, Ser. No. 463,966

Int. Cl.³ F41B *15/02*

U.S. Cl. 273—84 R **4 Claims**



1. A hand-held police baton comprising;

a shaft having a substantially constant outer diameter throughout its length except for;

a first double tapered section forming a first waist area in said shaft and

a second double tapered section forming a second waist area in said shaft, said waist areas being arranged symmetrically around the center of said shaft, the distance between said waist areas being adapted to accommodate the width of an operator's hand and being approximately equal to one-third the total length of the baton.

4,522,399
DEVICE FOR GENERATING IMPACT SOUND FOR SLOT MACHINE

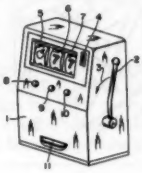
Ikuo Nishikawa, Tochigi, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

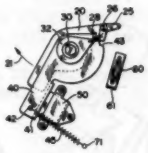
Continuation of Ser. No. 518,939, Aug. 1, 1983, abandoned. This application Aug. 29, 1984, Ser. No. 645,525

Claims priority, application Japan, Aug. 2, 1982, 57-116221[U]

Int. Cl.³ A63F 5/04

U.S. Cl. 273—143 R 6 Claims





1. In a slot machine of the type in which a display of a plurality of rotating juxtaposed reels is initiated by rotating a handle, the improvement comprising:

a first member movable in an interlocked relation to said handle;

a second member coupled to said first member and movable in unison therewith free from movement relative thereto during forward rotation of said handle;

means for disengaging said first and second members from each other substantially at the end of the full forward rotation of said handle;

a spring for biasing said second member in the direction opposite to the direction of movement of said first member;

said second member being mounted for rapid free return motion under the influence of said spring; and

a third member for producing an impact sound when struck by said second member in the return motion thereof after disengagement from said first member.

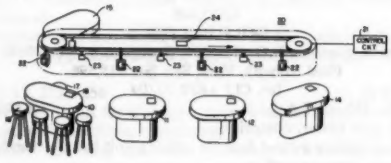
4,522,400
CONVEYOR SYSTEM AND METHOD FOR RANDOMLY TRANSPORTING CARD RACKS TO GAMBLING TABLES

Pat Trilli, 1529 Dean St., New York, N.Y. 11213

Filed Apr. 2, 1984, Ser. No. 595,690

Int. Cl.³ A63F 1/10

U.S. Cl. 273—148 A 15 Claims



1. Apparatus for distributing racks of cards to a plurality of card tables as located in a casino and arranged about a given path about the casino floor, comprising

a drivable belt means arranged to traverse said given path, said belt means having positioned thereon a plurality of housings each capable of converying a rack of cards for each of said tables and spaced apart on said belt means according to the spacing between said tables, whereby when one housing is in the vicinity of one table each of the other housings is in the vicinity of an associated table,

control means coupled to said belt means for driving the same about said path and means responsive to the position of said housings for randomly stopping said belt means to cause a random distribution of said housings with respect to said tables, whereby each of said tables will be associated with a different housing according to the operation of said means for randomly stopping said belt means, to thereby enable each table to receive different racks of cards during play.

12. A method of distributing card racks between a plurality of card tables as located in a casino and arranged about a given path about the casino floor comprising the steps of:

transporting said plurality of card racks from table to table in a closed and continuous path,

randomly stopping the transport of said racks at said tables to cause a different rack to stop at a different table in a random manner,

replacing said rack of cards as stopped at said table with the rack of cards presently used at said table and repeating the steps of transporting, stopping and replacing.

4,522,401
MANIPULATABLE PUZZLE TOY

William O. Gustafson, 2712 E. Robinson Ave., Fresno, Calif. 93726

Filed Sep. 8, 1981, Ser. No. 299,738

Int. Cl.³ A63F 9/08

U.S. Cl. 273—153 S 2 Claims

2. A puzzle comprising: a three dimensional support; a plurality of closed loop tracks carried by said support and lying in mutually perpendicular intersecting planes; a plurality of equilateral, quadrilateral elements of at least two distinguishable types disposed in said tracks for movement therein, said elements occupying substantially the entire extent of said tracks; said elements being constrained for movment in the tracks in which they are disposed except at the track intersections at which the elements can be selectively transferred from one track to another, said elements each having a prescribed orientation which is not changed when the elements are transferred from one track to another.

4,522,402
TRIANGULAR PRISM GAME-PUZZLE

Rohan G. Henry, 1230 Walnut St., Newton, Mass. 02161

Filed Feb. 16, 1983, Ser. No. 466,978

Int. Cl.³ A63F 9/08

U.S. Cl. 273—153 S 9 Claims

1. A puzzle-game comprising:

first, second, third and fourth triangular prism-shaped members;

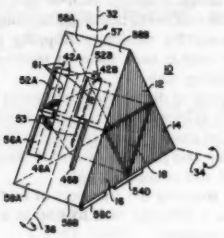
a first face of each of the first, second and third triangular prism-shaped members being rotatably fastened, respec-

tively, to the first, second and third prism faces of the fourth prism-shaped member;

a plurality of pairs of corresponding indicia members;

means for removably retaining no more than two indicia members on each of the second and third faces of the first, second and third prism-shaped members;

means for allowing only one of the indicia members to be moved at a time from one of said second and third faces of one of said first, second, and third prism-shaped-members



to one of said second and third faces of an adjoining one of said first, second, and third prism-shaped members;

whereby a combination of successive movements of indicia members from a face of a prism-shaped member to an adjacent face of a neighboring prism-shaped member and rotation of prism-shaped members the puzzle may be solved and pairs of corresponding indicia members may be caused to be positioned in adjacent positions on the faces of the prism-shaped members.

4,522,403

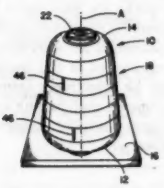
BALANCE TOY

Michael W. Maciorowski, 5421 S. Keeler Ave., Chicago, Ill. 60632

Filed Dec. 27, 1983, Ser. No. 565,382

Int. Cl.³ A63F 9/08

U.S. Cl. 273—154 **9 Claims**



1. A balance toy comprising a body having a top portion and a bottom portion and having a plurality of sections mounted therebetween, each said section moveable with respect to the other about a common axis, said common axis comprising an elongated rod connecting the top portion and the bottom portion and maintaining the sections adjacent each other between the top and bottom portions, at least two of said sections having a weighted portion spaced from said axis; and means for causing said toy to tilt when said weighted portions are not arranged so as to counter balance one another.

4,522,404

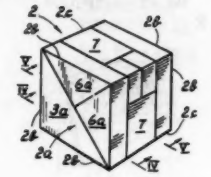
SUBDIVIDED BLOCK COMPONENTS REASSEMBLABLE INTO THREE DIMENSIONAL FIGURES

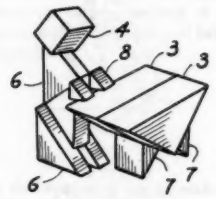
Vincenzo Di Gregorio, Via Alta Del Poggio, 6, 22050 - Montevecchia - (COMO), Italy

Filed Jun. 14, 1984, Ser. No. 620,843

Int. Cl.³ A63F 9/12

U.S. Cl. 273—157 R **13 Claims**





1. A didactic game defined by a block subdivided into suitable portions to compose three-dimensional figures, characterized in that said block is generally fashioned after a quadrangular prism having for its bases equal-sided parallelograms, and in that said portions comprise: first prismatic bodies identical to one another and defining together a volume at least close to one half the volume of said block and being configured as right prisms having isosceles triangle bases, said first prismatic bodies being bounded by the outer surface of said block, a first section plane containing two opposed corner edges of the lateral surface of said quadrangular prism, and at least one second section plane extending perpendicular to said corner edges and parallel to said isosceles triangle bases, second prismatic bodies fashioned as right prisms with triangular bases extending parallel to the bases of said first prismatic bodies and to a height equal to or being a submultiple of the height of each of said first prismatic bodies, and at least one inner body in the form of a right parallelepipedon having rectangular bases extending parallel to the bases of said first prismatic bodies and the same height as each of said first prismatic bodies, said inner body having a lateral face lying on said first section plane and the lateral corner edges of the opposed lateral face lying on the surface of said block.

4,522,405

GOLF PUTTER

Charles A. Clawges, P.O. Box 356, Georgetown, S.C. 29440

Filed May 31, 1984, Ser. No. 615,598

Int. Cl.³ A63B 53/04

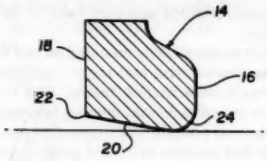
U.S. Cl. 273—167 A **1 Claim**

1. A golf putter, comprising:

a head having a front face for striking golf balls, a rear face and a bottom surface,

said bottom surface being substantially smooth and being disposed in a substantially flat plane that is inclined downwardly and substantially continuously from said front face toward said rear face, said flat plane extending from the lower edge of said front face to a position proximate said

rear face, said bottom surface being joined generally tangentially to a curved surface connecting said bottom surface and said rear face,



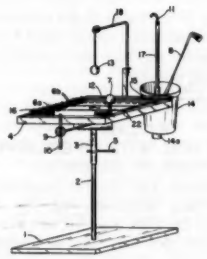
whereby the lower edge of said front striking face is slightly elevated relative to said curved connecting surface and said bottom surface will slide over the surface of a green like a sled in the event it engages the surface of the green before said front face engages the golf ball.

4,522,406

GOLF PRACTICE GAME

William R. Tarquinio, 1312 Great Oak Dr., Pittsburgh, Pa. 15220

Filed Sep. 28, 1983, Ser. No. 536,615
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—197 A **9 Claims**



1. A golf practice game for the elderly comprising a base, a vertical post rigidly mounted on the center of said base, a rectangular table mounted on top of said post, said post constituting the sole supporting means for said table, means on said post for adjusting the height of said table, an artificial turf strip slidably mounted on said table by rubber bands to return it to its initial position after being forcibly struck by a golf club, a golf tee mounted on said table, and means for supporting short golf clubs and means for supporting golf balls, both said means supported by the said table, whereby said golf practice game is self contained.

4,522,407

FINANCIAL BOARD GAME

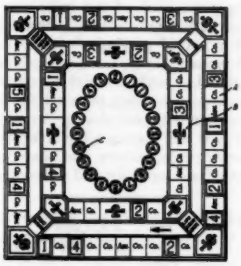
Bruce E. Hatherley, 2 Little Nicholson St., Balmain NSW 2041, Australia

Continuation of Ser. No. 227,897, Jan. 23, 1981, abandoned. This application Sep. 27, 1984, Ser. No. 655,315
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **21 Claims**

18. Apparatus for playing a game wherein players conduct financial transactions, comprising,

index indicating means for providing a randomly variable index of the purchasing power of currency, said index indicating means comprising an index track which has a plurality of index stations representing different values of said index, and an index marker which is movable along said index track, said index marker having a direction indicator thereon so that a designated player may determine the direction of movement to be taken by the index marker,

two main tracks provided with a plurality of stations including property stations, income stations and index-changing stations; said property stations being marked to represent different properties, said income stations being marked to indicate that income is to be paid to a player whose marker lands thereon, said index-changing stations being provided with means for dictating the number of index stations to be traversed by said index marker on said index



track, one said main track having a higher proportion of property stations and a lower proportion of income stations then the other main track, whereby a player may affect his financial strategy by selecting one of the main tracks for movement of his marker,

player markers movable along said main track to indicate the stations on said main track occupied by the players, and

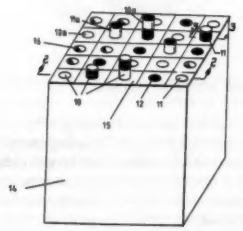
means for providing a chance selection of the number of track stations to be moved by the player markers on the main tracks.

4,522,408

PEG BOARD GAME APPARATUS

David M. McKee, 169 Cannon Dale Rd., Columbia, S.C. 29210

Filed Mar. 1, 1984, Ser. No. 585,270
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—271 **6 Claims**



1. In a game, the combination comprising:

(a) two sets of playing pieces each, to be used by one of two players, means distinguishing one set from the other, each set comprising playing pieces of a first, second, third and fourth type;

(b) said first, second, third and fourth types of playing pieces having a cross sectional configuration of given maximum external dimension and lengths;

(c) said playing piece of the second type having a length less than the said playing piece of the first type;

(d) said playing pieces of the third and fourth type having a length equal to the difference in length between the said first and second playing pieces;

(e) said first and second types of playing pieces each having

a top color and sides patterned with both said top color and a second color;

(f) said third type of playing piece being of either said top color or said second color;

(g) a playing board to be used by players, means carried on top side dividing said top side into a plurality of parallel rows and parallel columns defining a plurality of playing squares, each of said squares including a formed hole dimensioned to receive any playing piece of said first, second, third or fourth type, each of said holes having depth dimensions equal to the length of said first type of playing piece, each of said holes also having a depth dimension sufficient to naturally obscure one or two of said fourth types of playing pieces in darkness when said fourth type of playing pieces are positioned on the bottom of said holes, whereby playing pieces of said first and second type positioned in said holes independently or in combination with said playing pieces of the said third and fourth type will display a top color even with said board surface or project above said board surface displaying a pattern of said top color and a second color, respectively.

4,522,409

TOY ARCADE GAME

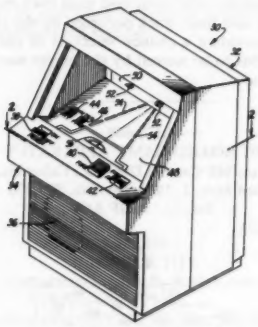
Nobuo Kobayashi, Tokyo, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan

Filed Feb. 3, 1983, Ser. No. 463,389

Claims priority, application Japan, Feb. 5, 1982, 57-17916

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—316 **52 Claims**



1. A toy game which comprises:

a housing;

drive means located on said housing;

target means mounted on said housing in operative association with said drive means, said target means including a target and a target coordination means, both said target and said target coordination means continuously moved on said housing by said drive means, said target moving through a target field wherein said target field includes a target hit position, said target coordination means moving between an interaction position and a non-interaction position with said target coordination means being in said interaction position when said target is in said hit position;

attack means movably mounted on said housing in association with said drive means, said attack means including an attack coordination means, said attack coordination means temporarily operatively connectible to said drive means and when so temporarily connected said drive means moving said attack coordination means;

initiator means operatively associated with said attack means, said initiator means located on said housing in a position enabling said initiator means to be acted upon by an operator of said toy and when so acted upon by said operator of said toy said initiator means operatively interacting with said attack means to temporarily operatively connect said attack coordination means with said drive means whereby said drive means moves said attack coordination means from its non-interaction position to its interaction position and then back to its non-interaction position;

interaction means slidably mounted on said housing in operative association with said target coordination means and said attack coordination means, said interaction means linearly movable on said housing between a first position and a second position, said interaction means slidable from its said first position to its said second position when both of said target coordination means and said attack coordination means are simultaneously in their respective interaction positions and said interaction means incapable of sliding from its said first position to its said second position when either one or both of said target coordination means and said attack coordination means are in their respective non-interaction position;

means associated with said interaction means for sliding said interaction means from its said first position to its said second position;

indicating means located on said housing, said indicating means capable of producing an output which is sensory perceivable by said operator of said toy, said indicating means producing said sensory perceivable output when said operator of said toy has acted upon said initiator means in association with said target being in said hit position resulting in both said target coordination means and said attack coordination means being in their interaction position thereby allowing said interaction means to move to its second position.

4,522,410

AXLE OR SHAFT SEAL WITH OVERLAPPING RING EXTENSION MEMBERS

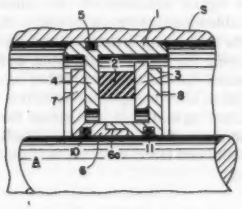
Helmut Hölzer, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,375

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337033

Int. Cl.³ F16J *15/38, 15/44*

U.S. Cl. 277—56 **20 Claims**



1. A seal for sealing about an axle or shaft rotatable axially relative to a structure thereabout, comprising:

inner and outer sealing rings for respective, fixed connection to the axle or shaft and structure thereabout, each ring having a pair of members associated therewith, at least one sealingly, and extending generally toward the other ring, the members associated with one ring being axially between the members associated with the other ring; and

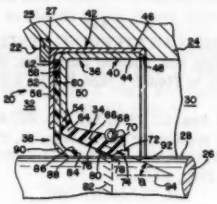
a resilient element between the members associated with the one ring for urging the members associated with the one ring axially of the axle or shaft into sealing engagement with the members associated with the other ring,

whereby to maintain uniform sealing engagement force between the members irrespective of relative axial displacement between the axle or shaft and structure thereabout.

4,522,411
FLUID SEALS WITH SELF-VENTING AUXILIARY LIPS

Thomas J. Burgan, Homewood, Ill., assignor to Chicago Rawhide Mfg. Co., Elgin, Ill.

Filed Oct. 1, 1984, Ser. No. 656,267
Int. Cl.³ F16J *15/32, 15/54*
U.S. Cl. 277—134 10 Claims



1. A fluid seal unit adapted to provide, in use with an associated sealed mechanism, a hydrodynamic fluid seal pumping function and a dirt exclusion function, said seal unit comprising, in combination, an annular casing unit adapted for reception within one portion of a sealed mechanism, said casing unit also including a portion to which an elastomeric seal lip may be bonded, and first and second seal lip units, said first seal lip being an elastomeric annular seal lip having a principal body portion defined in part by air and oil side frusto-conical lip surface portions meeting each other to define a generally circular primary fluid seal band adapted to contact another portion of said sealed mechanism in substantially fluid-tight sealing relation with a sealed region lying axially inwardly of said seal band, said body portion of said first lip also including hydrodynamic elements adapted to cooperate with said other part of said sealed mechanism to create a pumping action upon relative rotation between said seal lip and said sealed mechanism other part, which pumping action is effective to return oil from the air side of said seal to said sealed region, said second seal lip unit being a dirt excluder lip having a body with one margin thereof affixed to said casing and the body portions thereof spaced radially from said affixed margin being a sealed part contact portion comprising generally axially inwardly and outwardly facing surfaces and at least one sealed part contact edge lying between said inwardly and outwardly facing excluder lip surfaces, said second lip unit being constructed and arranged such that, in its relaxed condition, said sealed part contact edge lies closer to said other portion of said sealed mechanism than does said primary seal band in its installed condition, and such that said contact edge and said body portion of said second lip lying closest to said other part of said sealed mechanism lie axially closer to said primary seal band than does said margin of said exluder lip affixed to said casing, whereby said contact edge of said excluder lip may be readily lifted from said other sealed mechanism part to vent the area between said primary seal band and said contact edge in the presence of vacuum in such region, to prevent vacuum buildup in such region.

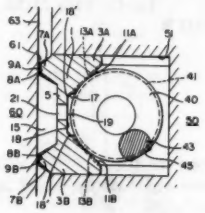
4,522,412
OIL RING WITH COIL EXPANDER

Yukihiko Kubo, Okaya, Japan, assignor to Keikoku Piston Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 436,811, Oct. 26, 1982, abandoned.
This application Jun. 11, 1984, Ser. No. 618,766
Int. Cl.³ F16J *9/06, 9/20*
U.S. Cl. 277—138 12 Claims

1. A piston ring comprising:

an oil-scraping oil ring, made of steel, having a generally I-shaped cross-section consisting of upper and lower side rails which are mass of rigidity and a thin web for connecting the upper and lower side rails, the thickness of said web being not more than 0.8 mm, said web having a large number of oil vent holes punched along a periphery thereof, said upper and lower side rails and web defining an outer peripheral channel for receiving oil scraped and an inner peripheral groove for receiving a coil expander, said side rails having inclined flat surfaces, in the cross-section, converging to a peripherally extending center line

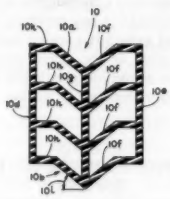


of the web, so as to define the trapezoidal inner peripheral groove, said annular coil expander located in said inner peripheral groove and bearing against the upper and lower side rails substantially at two points, in the cross-section, said coil expander being spaced from the web of the oil ring to provide a slight gap therebetween.

4,522,413
PAVEMENT JOINT SEAL WITH CHEVRON-SHAPED WALLS

John D. Nicholas, Holbrook, N.Y., assignor to Elastomer Seals, Inc., Copiague, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,193
Int. Cl.³ F16J *15/10;* E01C *11/10*
U.S. Cl. 277—205 1 Claim

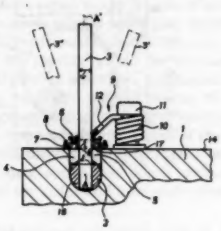


1. In an extrusion of elastomeric material adapted to form the flexible sealing member between the vertical faces of an expansion joint of a concrete structure of the type having a periphery comprised of chevron-shaped top and bottom walls and two chevron-shaped intermediate walls and two parallel side walls joining said top and bottom and intermediate walls, and having a vertically-extending interior wall connecting said four chevron shapes located centrally of said top and bottom and intermediate walls, the improvements to said chevron-shaped top and bottom and intermediate walls consisting of means for maintaining continuous contact between said side walls and the concrete vertical faces in the form of horizontally-extending length portions of one third the total horizontal extent of said sealing member in said top and bottom and intermediate walls connecting said side walls to said centrally located chevron shapes, and said chevron shapes extending the remaining two thirds of the horizontal extent of said sealing member and being formed by angled wall length portions subtending an angle to the horizontal of at least 45 degrees, whereby the chevron shapes located inwardly of said wall horizontal length portions are urged through descending movement in response to diminishment in size of the expansion joint instead of being squeezed between said side walls.

4,522,414
SEAL ASSEMBLY FOR PIVOTAL ROD

Heinz Schulte, Marktheidenfeld, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,732
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333163
Int. Cl.³ F16J 15/52
U.S. Cl. 277—212 R 10 Claims

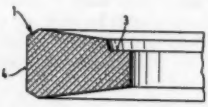


1. In combination with:
a support having a flat surface and formed with a bore extending generally parallel to but beneath the surface and with a passage extending from the bore to the surface;
a control element in the bore and pivotal therein about an axis generally parallel to the surface; and
a control rod projecting from the element through the passage beyond the surface, the rod being connected to the element and pivoting therewith about the axis through an arc on pivoting of the element in the bore about the axis;
a seal assembly comprising:
an elastomeric annular cuff having an inner periphery tightly engaging and secured against movement on the rod and an outer periphery engaging and slidable on the surface all around the passage and dimensioned to engage the surface all around the passage in any position of the rod, the cuff being prestressed generally parallel to the rod between its peripheries to press at the outer periphery against the surface, whereby as the rod pivots the periphery slides on the surface while remaining in sealing contact therewith.

4,522,415
PISTON RING FOR AN INTERNAL COMBUSTION ENGINE

Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,478
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301913
Int. Cl.³ F16J 9/20
U.S. Cl. 277—216 7 Claims

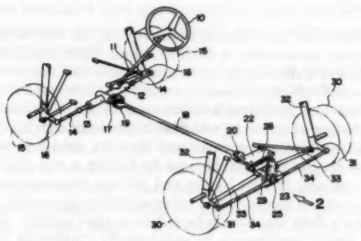


1. A piston ring for an internal combustion engine made of ceramic materials comprising a piston ring (1) consisting of a body from partially stabilized zirconium oxide (PSZ) made by sintering which has a porosity of less than 3%, and a proportion of the cubic modification not exceeding 80 wt.%, a proportion of the tetragonal modification between 20 and 60 wt.%, and a proportion of the monoclinic modification not greater than 6 wt.%, the proportions of the individual modifications making up 100 wt.%, and wherein the rolling surface (4) of piston ring (1) has a centerline average roughness R_a of 0.03 to 0.1 μm.

4,522,416
VEHICULAR STEERING SYSTEM

Shoichi Sano, Tokyo, and Yoshimi Furukawa, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,421
Claims priority, application Japan, Aug. 13, 1981, 56-127349; Dec. 2, 1981, 56-194249; Jun. 1, 1982, 57-93394; Jun. 1, 1982, 57-93398; Jun. 2, 1982, 57-94355
Int. Cl.³ B62D 7/00
U.S. Cl. 280—91 37 Claims



1. A steering system for a vehicle provided with at least one front wheel and two rear wheels; a steering wheel; front wheel steering means for steering said front wheel in directions responsive to turning directions of said steering wheel by angles corresponding to turning angles of said steering wheel; and rear wheel steering means for steering said rear wheels in the same steering directions as said front wheel when said turning angles of said steering wheel relatively small, and in directions opposite to the steering directions of said front wheels when said turning angles of said steering wheel are relatively large, wherein:
said rear wheel steering means comprises:
a crank member operatively connected to said steering wheel;
a movable member connected to said crank member;
restriction means for restraining said movable member and permitting said movable member to perform only restricted movements in a predetermined curved pattern;
an output mechanism interconnecting said movable member with each of said rear wheels for effecting said steering of said rear wheels according to components of motion in a predetermined direction of said restricted movements;
said predetermined pattern being disposed on a virtual plane substantially including a straight line in said predetermined direction, said predetermined direction being a substantially transverse direction of said vehicle and said virtual plane being substantially orthogonal to a longitudinal center line of said vehicle;
said restriction means being adapted to move in said virtual plane when restraining said movable member;
said output mechanism comprising a pair of knuckle arm members respectively supporting said rear wheels and being pivotable in a substantially transverse direction of said vehicle, and a pair of rod members each pivotably connected at one end thereof to one of said knuckle arm members and connected at the other end thereof to said movable member;
the width dimension of said movable member in said transverse direction of said vehicle being substantially small relative to the lengths of said rod members; and
said other ends of said rod members being connected to said

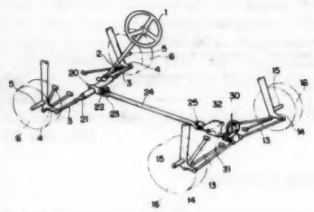
movable member at points equally remote from the connecting point between said crank member and said movable member.

4,522,417

STEERING SYSTEM FOR VEHICLES

Shoichi Sano, Tokyo, and Yoshimi Furukawa, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,438
Claims priority, application Japan, Oct. 22, 1982, 57-185495; Oct. 29, 1982, 57-190379; Nov. 4, 1982, 57-194374
Int. Cl.³ B62D 7/00
U.S. Cl. 280—91 9 Claims



1. A steering system for a vehicle having front and rear wheels, comprising:

a steering wheel;

a front wheel steering sub-system for steering said front wheels in accordance with the steering angle of said steering wheel;

an angle take-out mechanism for taking out from said front wheel steering sub-system an angular displacement according to the steering of said steering wheel;

a pair of rear wheel turning mechanisms for respectively turning said rear wheels in accordance with two linear displacements, respectively, substantially in the transverse direction of said vehicle; and

function generating means for generating a compound function of said angular displacement to determine said linear displacements, said compound function being such that the direction of each said linear displacement in a relatively small steering angle range of said steering wheel is opposite to that in a relatively large steering angle range of said steering wheel and the maximum absolute value of the function in said small steering angle range is less than that in said large steering angle range.

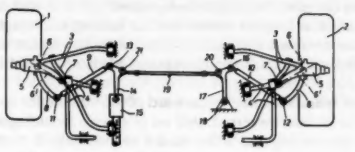
4,522,418

STEERABLE WHEEL SUSPENSION ARRANGEMENT

Helmut Struck, Winnenden; Karl H. Richter, Kernen im Remstal; Michael Klein, Waiblingen; Ulrich Ruth, Stuttgart, and Walter Ulke, Neuhausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,043
Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216728
Int. Cl.³ B62D 7/08, 7/16
U.S. Cl. 280—95 A 10 Claims

1. Motor vehicle, in particular a passenger car, possessing an axle with steerable wheels, on which axle the wheels are connected to a steering-gear box via a steering linkage which, starting from the steering box, is composed of two part sections containing a plurality of linkage member connection joints, each part section including joints of different construction than the joints of the other part section each part section interconnecting one of the wheels with the steering-gear box, wherein



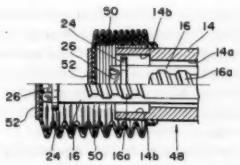
the overall stiffness of one of the two part sections is equal to the overall stiffness of the other part section.

4,522,419

RACK AND PINION TYPE STEERING DEVICE

Kenji Yoshida, Zama, and Yuichi Sanada, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 11, 1983, Ser. No. 465,993
Claims priority, application Japan, Mar. 31, 1982, 57-52722
Int. Cl.³ B62D 3/12
U.S. Cl. 280—96 6 Claims



1. A rack and pinion type steering device comprising:

a gear housing having a through bore formed therein;

a rack shaft axially movably received in said through bore with its opposed first and second end portions projected from the both open ends of said gear housing;

a pinion engaging with the teeth of said rack shaft to move said rack shaft axially in response to turning of the steering wheel;

a first cover member disposed about said first end portion of the rack shaft with its inside end sealingly fixed to said gear housing and its ouside end sealingly fixed to the leading end of said first end portion, said first cover member being constructed to be axially expansible and contractable in response to movements of said rack shaft; and

an elastic bellows boot disposed about said second end portion of the rack shaft with its inside end sealingly fixed to said gear housing and an outside closed end portion integral therewith to sealing cover said second end portion, said elastic bellows boot being axially expansible in response to the axial movements of said rack shaft in one direction, and said elastic bellows boot being constructed to assume its contracted position when no external force is applied thereto.

4,522,420

ALL TERRAIN VEHICLE CONVERSION SYSTEM

Gerald J. Hannappel, 708 W. Solano Dr., Phoenix, Ariz. 85013

Filed Aug. 4, 1983, Ser. No. 520,150
Int. Cl.³ B62J 7/04, 9/00
U.S. Cl. 280—289 A 10 Claims

1. Apparatus for conveying cargo and limiting the rearward tilt of an all terrain vehicle, said apparatus comprising in combination:

(a) a rear support means secured to the framework of the vehicle;

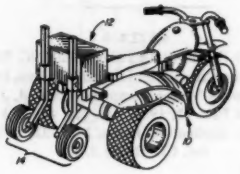
(b) a cargo box for conveying cargo;

(c) stud means extending from said cargo box for engaging and

for receiving support from said rear support means to locate said cargo box in fixed position with respect to the framework of the vehicle;

(d) means for selectively detachably attaching said stud means with said rear support means and for locking said cargo box in place to resist movement relative to the frame of the vehicle from any externally imposed loads upon said cargo box;

(e) a set of wheels locatable rearward of the vehicle for contact with the surface traversed, said set of wheels including a first and a second leg and a first and a second wheel rotatably secured to respective ones of said first and second legs;



(f) means for attaching each of said first and second legs to and receiving support from said support means; and

(g) means for securing each of said first and second legs to said attaching and receiving means in a selected one of a plurality of vertical positions to regulate the amount of tilt of the vehicle permissible before a wheel of said set of wheels contacts the surface traversed;

whereby, said cargo box provides an opportunity for carrying cargo and said set of wheels are vertically adjustable to prevent rearward tilting of the vehicle beyond a predetermined tilt angle.

4,522,421

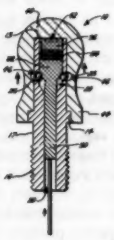
INTERCHANGEABLE TRAILER BALL ASSEMBLY

Thomas L. Vance, 2939 Second Ave. North, Hudson, Fla. 33567

Filed Apr. 20, 1983, Ser. No. 486,679

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—511 **10 Claims**



1. An interchangeable trailer ball apparatus comprising:

a. an elongated bumper pin having an internal longitudinal bore, and at least one lateral bore intersecting the longitudinal bore;

b. attachment means for removably affixing the bumper pin to a vehicle bumper;

c. at least one locking element movably mounted in the lateral bore between retracted and projected positions;

d. an operable actuating rod movably mounted in the bumper pin longitudinal bore so that longitudinal movement of the rod within the longitudinal bore between respective upper and lower positions can effect movement of the locking element respectively between the retracted and projected positions;

e. a trailer ball having an opening at its lower end that is receptive of the bumper pin;

f. recess means on the trailer ball and communicating with the trailer ball elongated opening for forming a connection with the locking element when the locking element is in the projected position so that the trailer ball can be secured to the bumper pin.

4,522,422

SKI BINDING

Knut Jaeger, Kirchheim, Fed. Rep. of Germany, assignor to ESS GmbH Skibindungen, Immenstadt, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,373

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109754

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—617 **5 Claims**

1. A ski binding comprising

a toe unit,

a first guide track adapted to be fixedly attached to a ski and which carries the toe unit for slidable movement lengthwise of the ski,

locking means for selectively fixing the position of the toe unit relative to the first guide track,

a heel binding,

a second guide track adapted to be fixedly attached to the ski and which carried the heel binding for slidable movement lengthwise of the ski,

a connector element which is rigid in the lengthwise direction of the ski while being flexible in the plane of the ski and fixedly attached at its forward end to the toe unit, while the heel binding is slideable along the rear end of the connector element,

adjustment means for selectively fixing the position of the heel binding relative to the rear end of the connector element and having a spring element which is located in the path through which the heel binding moves relative to the connector element and which presses the heel binding with substantially constant force against a ski boot inserted into the binding,

a stationary plate near the toe unit which forms a passageway for free movement of the connector element therethrough, and

heel spacer elements on both sides of the connector element near the heel binding for the protection of the connector element.

4,522,423

SAFETY BINDING OF A BOOT ON A SKI

Gaston Haldemann, Fürigen, and Francois Wirz, Savièse, both of Switzerland, assignors to Haldemann A.G., Stans, Switzerland

Filed Jan. 18, 1983, Ser. No. 458,908

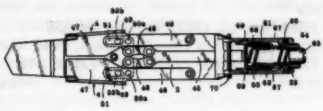
Claims priority, application Switzerland, Jan. 27, 1982, 495/82

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—624 **13 Claims**

1. Safety binding of a boot on a ski comprising two lateral clamps movably mounted under the influence of a resilient member parallel to the plane of the ski between a closed position in which these clamps coact with the boot sole and an open position, characterized by the fact that each clamp is carried by an arm pivotally mounted on the ski and is connected to one end of a longitudinally slidable strip by means of

articulatedly interconnected rods, and by the fact that the other end of the strip coacts with a crank subjected to the



action of the resilient member, whereby this crank has two stable positions corresponding to the respectively open and closed positions of the clamp.

4,522,424

SKI BINDING CLAMP

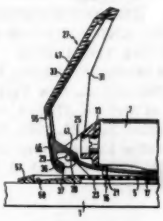
Max Luitz, Blaichach-Bihlerdorf, and Eugen Weiss, Burgberg, both of Fed. Rep. of Germany, assignors to ESS GmbH Skibindungen, Immenstadt, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 457,743

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1982, 3201319

Int. Cl.³ A63C *9/00*

U.S. Cl. 280—633 **8 Claims**



1. A ski binding clamp, particularly a toe clamp, having a base plate for attachment to a ski, a clamping unit guided along the base plate and displaceable lengthwise of the ski, and a movable locking arrangement for the clamping unit which can be locked to the base plate in predetermined displacement positions and which has a first locking member which is movably attached to the clamping unit and held by a spring in mating engagement with a second complementary locking member of the base plate, said ski binding clamp being characterized in that a double arm lever is pivotally attached to the clamping unit by means of a hinge pin, said lever having an operating arm and a disengaging arm which is shorter than the operating arm and which can be pivoted against the pretensioned force of the spring for disengaging the first locking member from the second locking member, and further characterized in that the lever has a locking projection on the side of its hinge pin which is opposite that of the disengaging arm, said locking projection bearing against said locking arrangement when said first locking member is disengaged, thereby reducing the displacement angle of which the lever is capable when said first locking member is engaged.

4,522,425

TWO WHEEL TRAILER

Harry J. Cornwall, 6275 E. Sixth St., Long Beach, Calif. 90803, and Daniel E. Hanebrink, 304 Riverside Ave., Sugarloaf, Calif. 92386

Filed Dec. 7, 1982, Ser. No. 447,617

Int. Cl.³ B62B *5/00*

U.S. Cl. 280—656 **10 Claims**

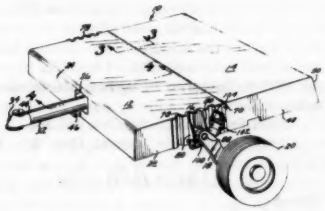
1. A two wheel trailer comprising:

a trailer body including adjacent forward and rearward sections which in their operative positions define, respectively, downwardly opening forward and rearward compartments, said forward and rearward sections being hingedly connected together for pivotal movement of said rearward section about a transverse axis into a storage position underlying said forward section;

a pair of suspension arms normally located in an outer position outwardly of the sides of said forward section, respectively, for pivotal movement about transverse pivot axes;

shock absorbing means carried by said sides of said forward section, respectively, and engageable with said suspension arms;

a pair of wheels carried by said suspension arms, respectively,



support means carried by the sides of said forward section for mounting said suspension arms, said support means being operative to enable said wheels and said suspension arms to be pivoted from said outer position to a retracted position within said forward compartment whereby, upon location of said rearward section in said storage position, substantially all of said suspension arms and all of said wheels are completely enclosed by said forward and rearward sections and locking means normally maintaining said suspension arms in said outer position but selectively operable to enable said suspension arms to move to said retracted position.

4,522,426

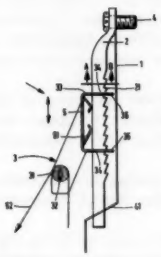
ADJUSTABLE HOLDER FOR VEHICLE SAFETY BELT

Olaf Weman, Heverlee, Belgium, assignor to Klippan GmbH Sicherheitsgerate, Norderstedt, Fed. Rep. of Germany

Filed May 9, 1983, Ser. No. 492,591

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—808 **7 Claims**



1. A holder device for adjustably securing, to a motor vehicle door column or other support member, a deflection member around which a motor vehicle safety belt or other strap is adapted to pass, said holder device comprising:

a. A toothed rack member secured in vertical position to said door column or other support members;

b. A connecting member of U-shaped cross sectional shape having upper and lower flanges each of which has a hole therethrough through which said toothed rack member is adapted to pass; and

c. Compression spring biasing means for biasing said connecting member horizontally in a direction to lock said connecting member on said toothed rack member;

d. The position of said connecting member on said rack member being manually adjustable vertically by pressing said spring means to unlock said connecting member from said rack member.

4,522,427

SLIPS

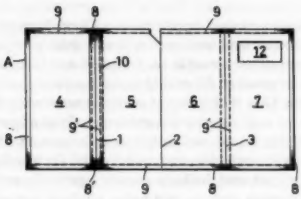
Taro Yasui, 2597-3, Tanigawa Tanagawa, Misaki-cho, Sennan-gun, Osaka, Japan

Filed Feb. 9, 1983, Ser. No. 465,338

Claims priority, application Japan, Dec. 14, 1982, 57-189650[U]

Int. Cl.³ B42D *15/00, 15/04*

U.S. Cl. 281—5 **5 Claims**



1. A combined arrangement of a series of slips and an envelope, said arrangement comprising:

a single sheet having a front side and a rear side;

said sheet being folded alternately along a center fold line and two lateral fold lines on opposite sides of and parallel to said center fold line to define two intermediate slips joined along said center fold line and two side slips joined to respective said intermediate slips along respective said lateral fold lines, such that front sides of said side slips contact front sides of respective said intermediate slips and rear sides of said intermediate slips are in contact, and such that said intermediate slips are substantially equal in width, said side slips are substantially equal in width, and said side slips are greater in width than said intermediate slips;

each said side slip and the respective said intermediate slip having formed therein, on opposite sides of the respective said lateral fold line, a pair of longitudinal lines of perforations;

each said side slip having formed therein, adjacent opposite longitudinal edges thereof, transverse lines of perforations;

each said side slip having applied to said front side thereof, along margin areas outwardly of said transverse lines of performations and along a margin area adjacent the respective lateral edge of said sheet, a layer of adhesive;

one said side slip and the respective said intermediate slip having applied to said front sides thereof, along a margin area on opposite sides of the respective said lateral fold line, a layer of adhesive having a width greater than the spacing between the respective said pair of longitudinal lines of perforations; and

each said intermediate slip having applied to said rear side thereof, along a margin area outwardly of the respective said longitudinal line of perforations, a layer of adhesive.

4,522,428

PRINTED MAGNETIC ENCODING PANEL

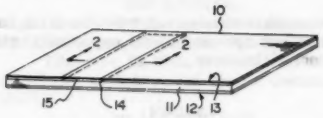
Edward A. Small, Nepean, and Geoff C. Wright, Ottawa, both of Canada, assignors to British American Bank Note Inc., Ottawa, Canada

Filed Nov. 12, 1982, Ser. No. 440,858

Claims priority, application Canada, Nov. 4, 1982, 414931

Int. Cl.³ B42D *15/00*; G11B *5/00*; G06K *7/08*

U.S. Cl. 283—82 **4 Claims**



1. A method of making an identification card having a magnetic encoding panel comprising the steps of applying a protective film to a core stock to leave a drop out area, printing a magnetic encoding panel on said core stock in said drop out area, and polishing both the protective film and the printed magnetic encoding panel.

4,522,429

METHOD OF RENDERING DOCUMENTS RESISTANT TO PHOTOCOPYING, AND ANTI-COPYING PAPER AND INK THEREFOR

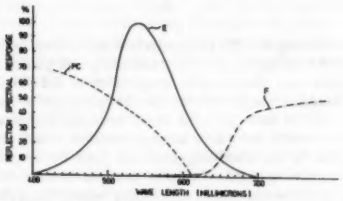
Norman A. Gardner, and Michael P. Voticky, both of Montreal, Canada, assignors to Nocopi Inc., New York, N.Y.

Continuation-in-part of Ser. No. 379,674, May 19, 1982, abandoned. This application Nov. 23, 1982, Ser. No. 443,819

Claims priority, application Canada, May 25, 1981, 378239

Int. Cl.³ B41M *3/14*; B42D *15/00*

U.S. Cl. 283—91 **33 Claims**



25. Anti-photocopying paper having a colour with a reflection spectral response of less than about 10% for light with a wave-length below about 600 millimicrons and yet which is sufficiently visually contrasting with information, when said information is typed thereon or otherwise applied thereto, to enable said information to be read by the human eye when the paper is viewed under white light.

4,522,430

QUICK CONNECT COUPLER

James L. Stromberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 238,802, Feb. 27, 1981, abandoned. This application Aug. 26, 1981, Ser. No. 296,325

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—24 **20 Claims**

1. A coupling to connect a first member to an end portion of a cylindrical member, the end portion having a radially outward extending shoulder having a longitudinal inward facing surface, said coupling comprising:

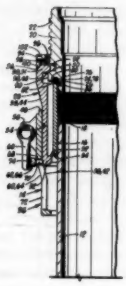
a body member disposable about a portion of the end portion of said cylindrical member and adapted to have said first member connected thereto, said body member having a

radially outer surface having, in turn, an annular collet receiving groove therein;

annular seal means for sealing between said body member and said cylindrical member;

a plurality of collet sections disposed around said body member, each of said collet sections having a first end adapted to be releasably connectable to the annular collet receiving groove in the radially outer surface in said body member and a second end adapted to be releasably engageable with a longitudinally inward facing surface of said shoulder of said cylindrical member;

an outer sleeve slidably disposed about said plurality of collet sections, said sleeve being slidable relative to said collet sections between an open position wherein said second ends of said collet sections may receive said shoulder of said cylindrical member therebetween and said first ends of said collet sections may receive therebetween the radially outer surface having an annular collet receiving groove therein of said body member and a closed position wherein said body member is sealingly coupled to said cylindrical member by said seal means and said second ends of said collet sections releasably engaging the longitudinally inward facing surface of said shoulder of said cylindrical member while said first ends of said collet sections releasably engage the annular collet receiving groove in the radially outer surface of said body member; and



release means, operably associated with said plurality of collet sections and said outer sleeve, for moving said second ends of said collet sections out of engagement with said shoulder of said cylindrical member and for moving said first ends of said collet sections out of engagement with the annular collet receiving groove in the radially outer surface of said body member upon sliding of said outer sleeve from its closed position to its open position, said release means comprising:

a radially outer tapered cam surface on said outer sleeve;

a radially inner tapered first cam surface on said outer sleeve;

a plurality of radially outer tapered second cam surfaces, each radially outer tapered second cam surface of said plurality of radially outer tapered second cam surfaces being located on a collet section of said plurality of collet sections; and

a plurality of cam follower members, each cam follower member of said plurality of cam follower members being attached to said second end of each collet section of said plurality of collet sections and having a follower surface thereon engaging said radially outer tapered cam surface on said outer sleeve

whereby said radially inner tapered first cam surface on said outer sleeve being arranged and constructed relative to said plurality of collet sections that upon movement of said sleeve from its said open position toward its said closed position said radially inner tapered first cam surface on said outer sleeve engages said second ends of said plurality of collet sections and cams said second ends of said plurality of collet sections radially inward toward said cylindrical member to engage the annular collet receiving groove in the radially outer surface of said body member, and said radially outer tapered cam surface on said outer sleeve and said cam follower members being arranged and constructed that movement of said sleeve from its closed position to its open position moves said radially outer tapered cam surface into engagement with said follower surfaces of said plurality of collet sections and thereby cams said second ends of said plurality of collet sections radially outward away from engagement with the longitudinally inward facing surface of said shoulder of said cylindrical member.

4,522,431

SELF-ALIGNING CONNECTOR ASSEMBLY

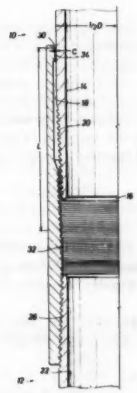
Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Continuation of Ser. No. 295,679, Aug. 24, 1981, Pat. No. 4,407,527. This application Oct. 3, 1983, Ser. No. 538,672

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ F16L *15/00*

U.S. Cl. 285—27 **1 Claim**



1. Apparatus for connecting tubular members of any size diameters, while preventing cross-threading, comprising:

a. a first tubular member having tapered, external threads toward a first end thereof;

b. a generally cylindrical external surface, as part of said first tubular member, axially displaced relative to said external threads and on the opposite side thereof from said first end;

c. a second tubular member having generally circular guide means toward a first end thereof;

d. said second tubular member further having tapered, internal threads generally complementary to said external threads, and axially displaced relative to said guide means;

e. wherein:

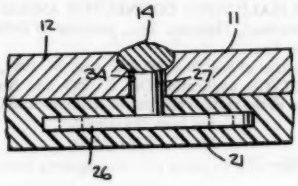
i. W is the distance between said guide means and the end of said external threads farther therefrom when said external threads are positioned to just avoid cross-threading with said internal threads;
ii. θ is the minimum misalignment angle between said first and second members for cross-threading;
iii. X_1 is the maximum radial gap between said first and second members when said members are mutually aligned;
iv. X_3 is the radial gap between the first member and said guide means when said misalignment angle is θ;
v. k is the thread taper;
vi. Z_6 is the minimum overlap of said internal and external threads necessary to initiate cross-threading; and
vii. $W=(X_1+(\frac{1}{2})X_3+kZ_6)/\tan\theta$.

4,522,432

COMPONENTS FOR LINED PIPING SYSTEM WITH ANCHORED LINERS AND METHOD OF MANUFACTURE

Irving D. Press, West Orange, N.J., assignor to UMC Industries, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 370,481, Apr. 21, 1982, abandoned. This application Nov. 23, 1983, Ser. No. 554,531
Int. Cl.³ F16L *9/14*
U.S. Cl. 285—55 **17 Claims**



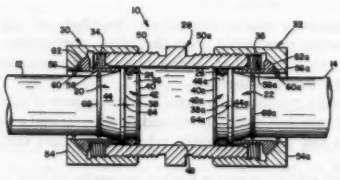
1. A component for a lined piping system comprising a metal housing lined with a non-metallic liner of molded material, and at least one structural anchor having a first part embedded and anchored in said liner and having a second part projecting from said liner and secured to said housing, said first part having a portion that extends laterally within said liner relative to said second part with the material of said liner surrounding at least said portion and thereby preventing said first part and liner from separating.

4,522,433

SPHERICAL SEAT FLEXIBLE O-RING COUPLING

Gordon A. Valentine, Denver, and Edwin J. Gale, Aurora, both of Colo., assignors to Stanley Aviation Corporation, Denver, Colo.

Filed May 14, 1982, Ser. No. 378,410
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—93 **9 Claims**



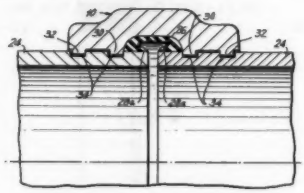
1. A flexible, fluid-conveying coupling for coupling a tubular fluid-conveying part to a further fluid-conveying part in a fluid-conveying system, comprising a sleeve, a tubular flange adapted to be fixed to said tubular fluid-conveying part and extending into said sleeve such that said sleeve circumferentially surrounds a portion of said flange with sufficient clearance to allow radial displacement of said flange relative to said sleeve, an elastically deformable seal ring carried by said flange and deformed between the inner periphery of said sleeve and said flange to establish a seal between said flange and said sleeve, said flange being formed with means for confining said seal ring against axial displacement relative to said flange, and means defining first and second bearing seats lying in seating engagement with one another and located axially beyond said sleeve, said first bearing seat having a diameter larger than the inner diameter of said sleeve thereby preventing said first bearing seat from entering said sleeve, said first bearing seat being operatively connected to said flange and said second bearing seat being operatively connected to said sleeve, said bearing seats providing for universal articulation of said flange relative to said sleeve about a center that lies at least in close proximity to a plane normally intersecting the longitudinal axis of said flange and passing through a pre-selected region of said flange, said pre-selected region lying within said sleeve and having an outer diameter that is at least approximately equal to the outside diameter of any other portion of said flange lying within said sleeve.

4,522,434

MULTIPLE KEY SEGMENTED PIPE COUPLING

Maurice J. Webb, Mountain Lakes, N.J., assignor to Victaulic Company of America, South Plainfield, N.J.

Filed Apr. 23, 1982, Ser. No. 371,438
Int. Cl.³ F16L *17/04*
U.S. Cl. 285—112 **14 Claims**



1. A coupling segment specifically for use in a piping system of high-pressure relative to the pipe strength in conjunction with at least one additional coupling segment comprising:
a substantially unfinished high strength metal casting of iron having substantial ductility and providing an arcuate member having an internal recess for the reception of a gasket;
a pad at each circumferential end of said arcuate member and cast integrally with said arcuate member, each said pad being adapted to receive securing means for securing said pad to the pad of an adjacent arcuate member with said arcuate members encircling a pipe;
at least one portion of said arcuate member extending axially to one side of said internal recess; and,
plural axially spaced continuous arcuate keys integral with and extending inwardly of the inner periphery of said axially extending portion, said keys respectively being for engagement within correspondingly axially spaced grooves in the periphery of said pipe for resisting relative axial movement between said coupling segment and said pipe under axial loading, each said key having an unfinished engagement face having an inversely pebbled surface produced in the casting thereof and which faces towards said internal recess, said engagement faces at all positions along the circumferential extent of said keys being substantially radial and perpendicular to the axis of generation of said arcuate member, said inversely pebbled surface of each said key being capable of crushing down and cold working the material of said pipe to provide

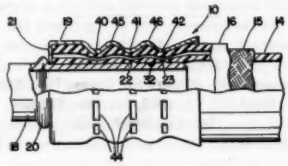
equalization of the stresses imposed on said keys when under axial loading.

4,522,435

HOSE COUPLING JOINT

William P. Miller, Willowick, and Atul Shah, Mentor, both of Ohio, assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,857
Int. Cl.³ F16L *9/14, 33/20*
U.S. Cl. 285—256 **9 Claims**



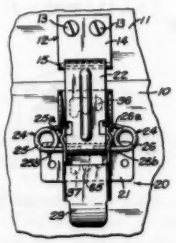
1. A hose coupling joint, comprising a hose having a thermoplastic liner, an inner tubular member, a seal on said tubular member, and a sleeve deformed into engagement with said hose for establishing a fluid-tight connection between said hose and said seal, said inner tubular member having annular barbs thereon and a groove intermediate adjacent ones of said barbs, said seal being disposed in said groove, said hose being in engagement with said seal, said barbs and said tubular member intermediate said barbs, said tubular member having outer cylindrical surfaces between said barbs and on inner and outer axial sides of said barbs, each said barb having a sharp inner edge, a conical outer surface and a generally cylindrical rib surface therebetween, said seal being elastomeric and having a volume substantially equal to the volume of said groove so as to substantially completely fill said groove when compressed and project substantially no further radially outwardly than said tubular member cylindrical surfaces between said barbs, said seal projecting no further radially outwardly than said cylindrical rib surfaces prior to assembly, said cylindrical rib surfaces being disposed radially outwardly substantially one half the thickness of said hose liner, and said sleeve being a metal collar having a pair of axially spaced, ring-like crimps straddling said seal for compressing said hose into engagement with said barbs and said seal.

4,522,436

SPRING-LOADED TOGGLE LATCH

Cuyler Hoen, Rennsselaer, and Frederick J. Pufpaff, Loudonville, both of N.Y., assignors to Simmons Fastener Corporation, Albany, N.Y.

Filed Apr. 6, 1983, Ser. No. 482,576
Int. Cl.³ E05C *19/14*
U.S. Cl. 292—113 **11 Claims**



1. A fastener to removably join first and second panels, including a fixed keeper member adapted to be connected to the first panel and a toggle latch adapted to be connected to the second panel, said toggle latch including:

a bracket member having a base plate and opposed upraised side portions, each side position having a through bearing hole;

a lever member pivotally mounted on said bracket member between its side portions and having a pivot means near one of its ends;

a pivotable hasp member having grasp means near one end to removably grasp said keeper member and having pivot means near its opposite end;

a left spring member and a right spring member each having a first inwardly extended spring arm captured in the pivot means of said pivotable hasp member, and a second inwardly extended spring arm through the bearing hole of said bracket member and the pivot means of said lever member;

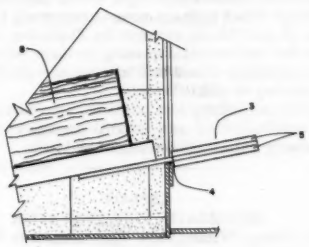
wherein the spring members perform three functions; they are the only means connecting the lever member and the pivotable hasp member to the bracket member, they pivotally mount the lever member and the pivotable hasp member on the bracket member, and they spring-load the pivotable hasp member.

4,522,437

LOG LOADING TOOL

Jon F. Gleman, 6470 SW. 83rd St., Miami, Fla. 33143

Filed Sep. 4, 1979, Ser. No. 72,410
Int. Cl.³ A47J *49/00*
U.S. Cl. 294—9 **1 Claim**



1. A method for loading a log or the like into the firebox of an end-loading stove comprising:

inserting a log loading tool into the stove;

placing the log onto said log loading device;

sliding the log into the firebox;

removing said log loading tool from the stove.

4,522,438

RETRIEVER AND DISPENSER FOR DEFORMABLE BALLS

DeWitt M. Logue, P. O. Box 988, Longview, Tex. 75606

Filed Jan. 6, 1984, Ser. No. 568,702
Int. Cl.³ A63B *47/02*
U.S. Cl. 294—19.2 **15 Claims**

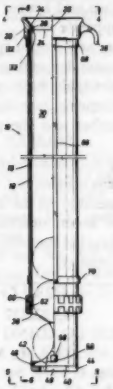
1. A retriever and dispenser for compressible balls such as tennis balls and the like comprising:

(a) an elongated tubular member having an internal passage of slightly greater dimension than the diameter of the balls to be contained therein, said tubular member defining first and second extemities, said second extremity forming a first dispensing opening;

(b) retrieving means at said first extremity of said tubular member forming a ball retrieving opening through which balls enter said internal passage, said retrieving means forming restriction means at said ball retrieving opening requiring balls to be slightly deformed as the balls are

forced past said restriction means and into said internal passage, said restriction means restraining balls from inadvertently falling from said retrieving opening when said tubular member is positioned vertically with said retrieving opening at the lower end thereof;

(c) a dispensing cap being rotatably connected at said second extremity of said tubular member and forming a transverse bottom wall supporting the lower ball when said tubular member is positioned vertically with said dispensing cap



at the lower end thereof, said dispensing cap further defining a wall portion forming a second dispensing opening through which balls are moved transversely of the centerline of said tubular member for dispensing of the same, said first and second dispensing openings being in registry for dispensing of said balls and out of registry to prevent dispensing of said balls; and

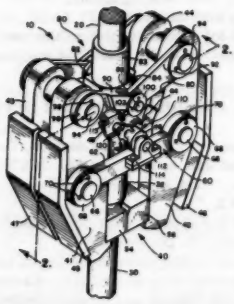
(d) means restraining free transverse dispensing movement of said balls from said internal passage and permitting manually induced dispensing of said balls.

4,522,439

AUTOMATIC PIPE ELEVATOR

Keith M. Haney, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Aug. 12, 1983, Ser. No. 522,490
Int. Cl.³ B25J *15/00*
U.S. Cl. 294—110.1 **24 Claims**



1. An elevator for drill pipe, comprising:

(a) at least two jaws, each jaw having a clamping surface shaped to support a length of pipe;

(b) a central linkage assembly, serving as a pivot means for urging the clamping surfaces of the jaws into contact with a length of pipe to be elevated, when the ends of the jaws distant from the clamping surfaces are urged away from the pipe; and

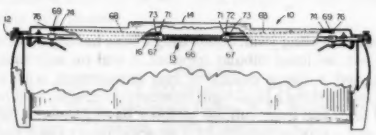
(c) an upper linkage assembly, serving as an elevator suspension and jaw activating means for suspending the elevator, for urging the ends of the jaws distant from the clamping surfaces away from the pipe, and in conjunction with the pivot means, for urging the clamping surfaces into contact with the pipe, when the elevator suspension and jaw activating means and a pipe are urged away from each other; and as a release means for urging the clamping surfaces away from the pipe when the elevator suspension and jaw activating means and the pipe are urged toward each other.

4,522,440

RAISABLE COVER

Richard B. Gostomski, 636 6th St., Owen, Wis. 54460

Filed Jul. 11, 1983, Ser. No. 512,839
Int. Cl.³ B60P *7/02*
U.S. Cl. 296—100 **13 Claims**



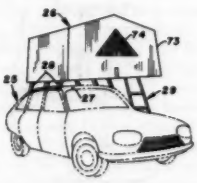
1. In a raisable cover for a container, the container having at least a first and second sidewall disposed substantially opposite from one another and forming at least in part a storage area therebetween, the raisable cover including a cover that spans said storage area and having first and second sides disposed substantially opposite from one another, first hinge means operably connectable between the first side of said cover and the first sidewall of said container, second hinge means operably connectable between the second side of said cover and the second sidewall of said container, and prop means operably connected to said cover to assist in holding said cover in a raised position when so desired, an improvement comprising hinge and lock means for providing said first and second hinge means, said hinge and lock means including two rods movably mounted proximal to the first side of said cover and two rods movably mounted proximal to the second side of said cover, four container brackets mounted in a fixed position with respect to said container, each container bracket operably interacting with and disposed to receive one of said rods, and four cover brackets affixed to said cover, each cover bracket operably interacting with and disposed to receive one of said rods.

4,522,441

COLLAPSIBLE SHELTER

Dallas K. Allison, 316 - 41st St., Western Springs, Ill. 60558

Filed Sep. 6, 1983, Ser. No. 529,283
Int. Cl.³ B60P *3/34*
U.S. Cl. 296—160 **33 Claims**



1. A shelter mounted on a vehicle comprising: a vehicle having a roof, a collapsible shelter having a flexible cover,

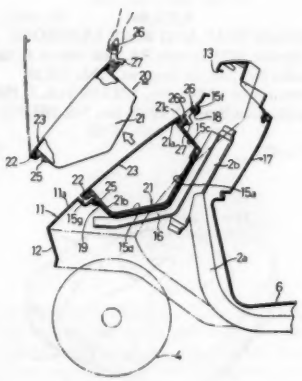
support means mounting the shelter on the roof, said shelter having a first platform attached to the support means, a second platform, hinge means pivotally connecting the second platform to the first platform for movement from a folded position adjacent one side of the first platform to an open position generally in the plane of the first platform, frame means for supporting the flexible cover above the first and second platforms to provide an enclosed space when the second platform is in its open position, said frame means including upright end posts, a ridge pole connected to the end posts, generally U-shaped side arms and saddle means slidably mounted on the end posts and connected to the side arms, means locating the frame means in a position between the folded first and second platforms and erecting the frame means above the platform when the second platform is in the open position, said means locating the frame means in a position between the folded first and second platforms and erecting the frame means above the platforms when the second platform is in the open position being connected to the saddle means and including cord means connected to the end posts and saddle means operable to erect the frame means when the second platform is moved to its open position, and means to support the second platform in its open position.

4,522,442

TRUNK STORAGE SYSTEM FOR SMALL VEHICLES

Masahiko Takenaka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 459,483
Claims priority, application Japan, Jan. 20, 1982, 57-7093
Int. Cl.³ B62J *7/00*
U.S. Cl. 296—37.1 **13 Claims**



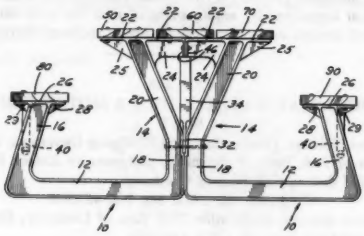
1. A trunk storage system for use in vehicles having a front leg shield, comprising:
a cavity within the front leg shield;
a removable trunk adapted to fit within said cavity;
wherein said trunk includes a lid member which forms a continuous surface with an exterior surface of the front leg shield;
means for maintaining said trunk in said cavity for selective removal thereof.

4,522,443

PICNIC TABLE

Karl Van Blankenburg, 32131 Claeys Dr., Warren, Mich. 48093

Filed Aug. 11, 1983, Ser. No. 521,995
Int. Cl.³ A47B *39/00*
U.S. Cl. 297—157 **2 Claims**



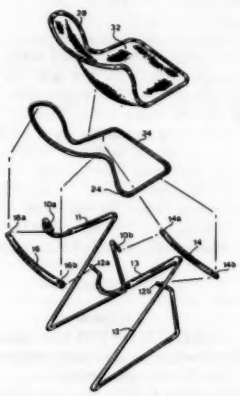
1. A table assembly which comprises:
(a) end supports comprising back-to-back identical leg units each having back uprights joined together to support one or more bridging top elements, and shorter front uprights to support bridging bench elements, the back uprights being parallel to each other in a lower section and diverging from each other in an upper section,
(b) a recess being formed on the contiguous areas of the lower sections to receive a flange of an angle support, and means transfixing the said lower sections and said flange, the other end of said angle support being fastened to the bottom of a bridging table element.

4,522,444

STACKING CHAIR

Charles Pollock, 34-24 86th St., Jackson Heights, N.Y. 11372

Filed Sep. 15, 1982, Ser. No. 418,510
Int. Cl.³ A47C *3/04*
U.S. Cl. 297—239 **7 Claims**



1. A chair comprising:
first and second side members each of said side members having a z-shaped main body with upwardly directed terminating portions, first and second ends of said first side member projecting perpendicularly thereto, third and fourth ends of said second side member projecting perpendicularly thereto, said first and third ends lying on the same axis and projecting towards each other, said second and fourth ends lying on the same axis and projecting

towards each other, a first cross member lying on the axis of said first and second ends and interconnecting said first and second ends, a second cross member lying on the axis of said third and fourth ends and interconnecting said third and fourth ends, said first and second cross members being parallel with said first cross member lying in a plane above said second cross member, a contoured seat, a continuous peripheral rim of said contoured seat, and said seat supported by engagement of said rim with said first and second cross members on upper surfaces thereof.

4,522,445

VEHICLE SEAT, PARTICULARLY A MOTOR VEHICLE SEAT

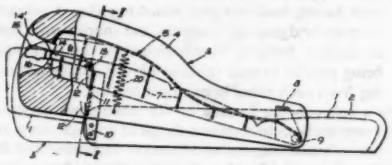
Walther Göldner, Denkendorf, and Wolfgang Gassmann, Lorch, both of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,118

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151018; Apr. 30, 1982, 3216060

Int. Cl.³ A47C *3/00*

U.S. Cl. 297—284 **19 Claims**



1. Vehicle seat, particularly a motor vehicle seat, comprising:

a seat covered with upholstery;

an upholstery support for the seat;

at least one upholstered side member arranged at the side adjacent the seat upholstery for laterally supporting a user of the seat and connected with the upholstery support for the seat so as to be pivotable about a pivot axis running in the lateral direction of the seat;

an upholstery support for the side member;

a locking device arranged so that the side member can be fixed in at least two different pivot positions, the cooperating elements of the locking device being connected with the upholstery support for the seat and the upholstery support for the side member respectively;

said locking device being self-locking in only one pivot direction and being releasable by a release member for pivoting movement of said side member in said pivot direction and including two associated locking members arranged at a distance from the pivot axis, one of which locking members passes by the other member during a pivoting movement of the side member and cooperates therewith in selected positions when the locking device is closed.

4,522,446

ARTICLE OF FURNITURE

Denise Sheridan, Bankstown, Australia, assignor to Sebel Operations Pty. Ltd., Bankstown, Australia

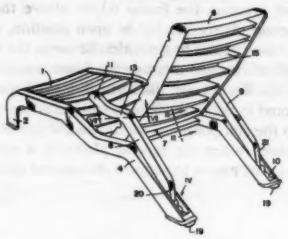
Filed Mar. 4, 1983, Ser. No. 472,346

Claims priority, application Australia, Mar. 15, 1982, PF3096

Int. Cl.³ A47C *1/024*

U.S. Cl. 297—377 **12 Claims**

1. A reclining chair assembled from only four major moulded plastic component parts which comprise a seat portion, a back portion and two struts with each of said parts being substantially integrally formed, wherein said seat portion is generally horizontal and includes a pair of front legs and a pair of rear legs; said back portion is pivotally connected at its lower end to said seat portion and movable between a substantially upright position and at least one inclined position; and said two struts are spaced apart by, and pivotally connected to, said back portion at a location spaced from the pivotal connection between said back and seat portions; the point of contact of each of said struts with the corresponding rear leg being adjustable to determine the degree of inclination of said back portion, and each said strut extending forwardly beyond said back portion to form a corresponding arm rest having an attitude adjustable simultaneously with the inclination of said back portion; wherein each rear leg has an upwardly opening channel of substantially C-shaped transverse cross-section; each channel having a transverse slot therein the length of



which is greater than the width of the remainder of said channel, and having a plurality of grooved steps located interior of the channel, and wherein the rear end of each said strut is provided with a transverse projection having a length less than both the length of said slot and the internal width of said channel but greater than the width of the opening of said remainder of said channel whereby each said strut is engageable with, said disengageable from, the corresponding channel only by passing the corresponding projection through the corresponding slot and the adjustable point of contact of each said strut with the corresponding rear leg comprises the point of engagement between each said strut rear end and one of the grooved steps in the corresponding channel.

4,522,447

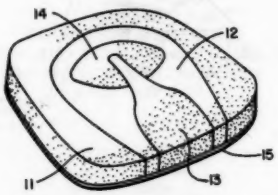
FOAM SEAT AND BACK CUSHIONS

William F. Snyder, 2174 Temple Rd., and Nelson P. Snyder, 702 West Charles St., both of Bucyrus, Ohio 44820

Continuation-in-part of Ser. No. 123,573, Feb. 2, 1980,. This application Sep. 17, 1981, Ser. No. 303,052

Int. Cl.³ A47C *7/02*

U.S. Cl. 297—452 **16 Claims**



1. A seat cushion comprising cellular elastic material, said material being divided into segments having different moduli of elasticity, the modulus of elasticity of each segment being inversely proportional to the pressure exerted on such segment by the anatomical portion to a person seated against said cushion to more uniformly distribute the supportive forces exerted by the cushion over a larger area of said anatomical portions, said segments comprising pre-formed blocks of said cellular elastic material assembled together to form said cushion,

a first, substantially horseshoe-shaped segment forming both side edges and the rear edge of said seat cushion;

a second, substantially horseshoe-shaped segment disposed within said first segment, said second segment being open at the front edge of said cushion;

a third, substantially wedge-shaped segment disposed within said second segment and extending rearwardly from said front edge of said cushion, said third segment tapering from said front edge toward said rear edge of said cushion and extending more than halfway from said front edge toward said rear edge of said cushion; and

a fourth, substantially elliptical prismatic segment having its major axis extending substantially across the width of said cushion, said fourth segment lying within said second segment and surrounding the rear end of said third segment, said third segment extending into the indentation defined by the forward wall of said fourth segment,

said first and third segments being relatively firm and said second and fourth segments being relatively soft.

4,522,448

METHOD AND APPARATUS FOR RECLAMATION BY REDUCING HIGHWALLS TO GRADABLE RUBBLE AT AUGERED OR LONGWALLED MINING SITES

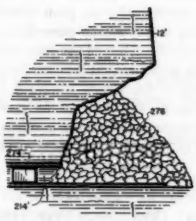
Leonard R. Nitzberg, 1413 Buckeye La., Knoxville, Tenn. 37919

Continuation-in-part of Ser. No. 64,558, Aug. 8, 1979, Pat. No. 4,244,624. This application Jan. 12, 1981, Ser. No. 224,294

The portion of the term of this patent subsequent to Jan. 13, 1999, has been disclaimed.

Int. Cl.³ E21C *41/00*

U.S. Cl. 299—13 **15 Claims**



12. A method for reclaiming a highwall at a surface mining site having at least one cavity extending into the face of said highwall, said cavity extending substantially horizontally into a preselected mineral deposit or seam of ore, said seam being disposed below overburden and above underpinning, said method comprising the steps of:

placing a plurality of charges at preselected locations within said cavity;

sealing said cavity with stemming produced by explosively presplitting a portion of said highwall proximate an opening to said cavity thereby eliminating the need for extraneous material for use as stemming; and

detonating each of said charges within said cavity thereby creating rubble from said highwall, overburden and underpinning.

4,522,449

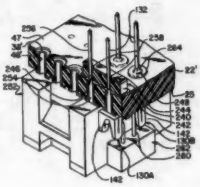
MATRIX BOARD

C. Michael Hayward, 23 Jacob Gates Rd., Harvard, Mass. 01451

Division of Ser. No. 314,578, Oct. 26, 1981, Pat. No. 4,455,749, which is a division of Ser. No. 64,372, Aug. 7, 1979, Pat. No. 4,330,684, which is a continuation-in-part of Ser. No. 864,457, Dec. 27, 1977, abandoned. This application Nov. 14, 1983, Ser. No. 551,337

Int. Cl.³ H05K *1/18*

U.S. Cl. 361—407 **1 Claim**



1. In a combination with an electronic assembly for connecting a bypass capacitor to a different electronic component with dependent leads, said component being mounted on a matrix board formed of an electrically insulating material provided with a plurality of apertures arranged in a rectangular grid with centers spaced apart by distances selected from the values which are integral multiples of about 0.1 inch, said matrix board further being provided on a first surface thereof with an electrically conductive ground plane path disposed so as to clear each of the majority of said apertures over a circular area, centered on each aperture, not exceeding about 0.1 inch in diameter; the improvement including:

first electrically conductive pin means for electrically connecting leads of said electronic component to a selected plurality of adjacent ones of said apertures so that said component is mounted adjacent the opposite surface of said board, said first conductive pin means extending through said selected plurality of apertures and beyond said first surface;

second electrically conductive pin means for electrically connecting leads of said capacitor to a selected pair of said apertures adjacent said selected plurality of apertures so that said capacitor is disposed adjacent said opposite surface with said second conductive pin means extending through said selected pair of apertures and beyond said first surface;

a discrete connector comprising:

(A) an elongated electrically insulating wafer having a length greater than about 0.1 inch and no longer than about 0.2 inch and having a width less than about 0.1 inch, said wafer having a pair of small circular holes penetrating therethrough and spaced about 0.1 inch center to center, and

(B) an electrically conductive bus disposed on one surface of said wafer and extending at least between said pair of circular holes; said connector being assembled adjacent said first surface so that said insulating wafer is positioned between said first surface and said electrically conductive bus, and so aligned that a selected pin of said first conductive pin means and a selected pin of said second conductive pin means respectively penetrate through said pair of circular holes so as to make electrical contact with said electrically conductive bus; and

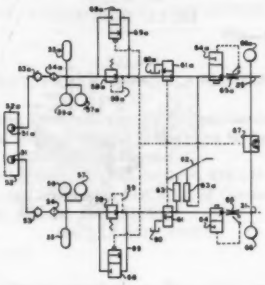
a discrete pair of electrically conductive, centrally apertured discs, each having an nominal outside diameter no greater than about 0.1 inch but greater than that of said circular area; said discs being assembled in electrical contact with said ground plane and aligned respectively in contact with a selected pin of said first conductive pin means and another pin of said second conductive pin means.

4,522,450

BRAKE SYSTEM

Joseph K. Heilbecker, Houston, and James E. Byrne, Spring, both of Tex., assignors to GH TTE, Wichita Falls, Tex.

Filed Apr. 27, 1983, Ser. No. 489,116
Int. Cl.³ B60T *7/12, 11/26*
U.S. Cl. 303—9 **9 Claims**



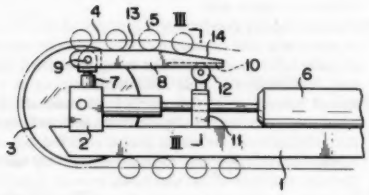
1. A brake system comprising:
a plurality of hydraulic brake means arranged in groups;
a separate hydraulic manifold for each group;
a separate control system for each manifold comprising:
a source of hydraulic fluid under high pressure,
a reducing valve reducing said high pressure fluid to a lower pressure fluid,
a fluid bypass around said reducing valve,
bypass valve means controlling said fluid bypass,
means connecting said reducing valve and said fluid bypass to a manifold and including means controlling application of at least said lower pressure fluid to said manifold to control application of said brake means;
said control means of each separate system ganged together for simultaneous operation; and
a differential pressure switch sensing the pressure in each manifold and when said pressures reach a selected differential opening said bypass valve to expose each separate system to said high pressure fluid.

4,522,451

TRACK-TYPE VEHICLE UNDERCARRIAGE

Yukio Tamura; Masashi Kaminishi, both of Hiratsuka, and Yutaka Kato, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,243
Int. Cl.³ B62D *55/10, 55/12, 55/30*
U.S. Cl. 305—18 **3 Claims**



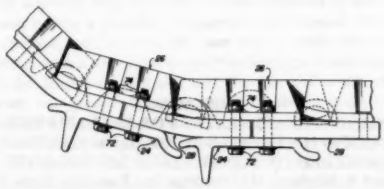
1. A track-type vehicle under carriage, comprising:
a track frame;
recoil means mounted on said track frame, said recoil means having a piston slidably mounted therein and means for biasing said piston forwardly;
mount means fixedly connected to said piston, said mount means being adapted to be slidable in the longitudinal direction of the vehicle relative to said track frame;
an idler rotatably mounted on said mount means;
a sprocket;
an endless track of linked together track shoes mounted around said idler and said sprocket, said endless track having a plurality of rollers mounted thereon;
a support member mounted on said mount means;
a bracket mounted on said track frame with a longitudinally spaced apart relation from said mount means;
roller means mounted for rotation on said bracket; and
a support rail pivotally mounted at one end thereof to said support member, the other end of said support rail being supported by said roller means, said support rail having a flat top surface and a downwardly inclined top surface formed thereon to permit a smooth travel of said endless track.

4,522,452

ENDLESS TRACK EMBODYING TRACK SECTIONS INCLUDING FLEXORS

William P. Wohlford, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 24, 1983, Ser. No. 460,214
Int. Cl.³ B62D *55/20, 55/24*
U.S. Cl. 305—43 **3 Claims**



1. In an endless track composed of a plurality of interconnected track sections which each include a pair of flexors arranged in side-by-side relationship to each other, a grouser, a link and a plurality of bolts extending through and holding the grouser and link together with first ends of the flexors positioned therebetween, the improvement comprising: said flexors being generally rectangular in plan view; said plurality of fasteners including some which pass through one and others which pass through the other of the pair of flexors; and the pair of flexors and the grouser and link all being configured such that upon removal of the screw fasteners associated with one of said pair of flexors, said one of the pair of flexors may be moved sideways from between the grouser and link while the other of the pair of flexors remains in place.

4,522,453

TRIBOLOGICAL COATINGS FOR THE PROTECTION OF MOVING MACHINE PARTS FROM WEAR AND CORROSION

Johann Lammer, Cormondreche; Hans R. Kocher, Presseux, and Hans-Erich Hintermann, Ins, all of Switzerland, assignors to Laboratoire Suisse de Recherches Horlogeres, Neuchatel, Switzerland

Continuation of Ser. No. 180,578, Aug. 25, 1980, abandoned, which is a continuation of Ser. No. 24,421, Mar. 27, 1979, abandoned. This application Sep. 17, 1982, Ser. No. 419,185
Claims priority, application Switzerland, Jul. 21, 1978, 7872/78
Int. Cl.³ F16C *17/00*
U.S. Cl. 308—3 R **1 Claim**

1. A tribological system, comprising:
a first machine element and a second machine element, in rolling or sliding contact with one another, coated with hard, wear-resistant layers of different compositions and

having low static and dynamic coefficients of friction between each other, wherein said first machine element is coated with a hard, wear-resistant layer of TiC, and said second machine element is coated with a hard, wear-resilient layer of TiN, said hard, wear-resilient layers covering said first and second machine elements with a protective and smooth tribologically coupled layer.

4,522,454

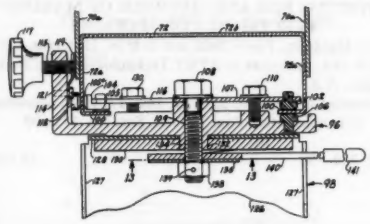
LINEAR SLIDE

Brian R. Hochstatter, Kankakee County, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 261,258, May 6, 1981, Pat. No. 4,453,691. This application Feb. 2, 1983, Ser. No. 462,837

Int. Cl.³ F16C *29/02*

U.S. Cl. 308—3 R **2 Claims**



1. A radial arm saw having a hollow horizontally extending radial arm comprising a top wall and spaced vertical sidewalls having the lower edge portions thereof formed horizontally inward to form coextending ledges, a carriage having opposite sides supported for longitudinal sliding movement on said ledges, a plurality of low friction elements mounted in aligned pairs on and along one side of said carriage with the elements of each pair bearing against opposite sides of one of said vertical sidewalls thereby to guide said carriage along said one vertical sidewall, and means to support said carriage on said ledges comprising two low friction elements mounted in longitudinal spaced relationship on and along one side of said carriage and resting on one of said ledges and a single low friction element mounted on the other side of said carriage and resting on the other of said ledges and said single element being positioned longitudinally substantially between said two low friction elements.

4,522,455

MODULAR ELECTRIFIED COVER PLATE

Richard H. Johnson, 3401 White Diamond, Prior Lake, Minn. 55372

Filed Oct. 11, 1983, Ser. No. 540,679

Int. Cl.³ H01R *19/46*

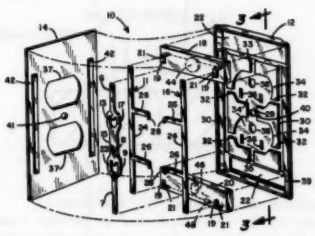
U.S. Cl. 339—14 R **6 Claims**

1. A cover plate for an electrical wall outlet having at least one raised receptacle portion comprising:

(a) a front cover member having a generally planar outer surface, a formed inner surface having at least two recessed channels and integrally joined edge walls extending out of the plane of said outer surface, said formed inner surface and said edge walls defining at least one compartment, said front cover member further having at least one pair of apertures extending through said outer surface centrally of a recess in said inner surface and spaced from one another to receive the prongs of an electrical plug when said plug is inserted through said front cover member and into said at least one raised receptacle portion of said wall outlet;

(b) an electrical circuit containing module having electrical contacts thereon, said module dimensioned to fit within said compartment;

(c) at least two conductive buses mounting in said recessed channels, each having a conductive finger thereon individually leading to one of said pair of apertures and mounting in resilient overlapped relation to said apertures so as to be displaced by and make electrical contact with the prongs of said plug when inserted therein, said buses further contacting said electrical contacts on said circuit module and completing an electrical current path to said circuit module when said plug is inserted into said receptacle portion of said wall outlet;



(d) a generally planar rear cover member having at least one opening formed therethrough for receiving said raised receptacle portion of said wall outlet, said rear cover member mounting in abutting relation to said edge walls of said front cover member and holding said module and said conductive buses therebetween and said receptacle portions in alignment with said front cover member and apertures; and

means for securing said cover plate to said wall outlet.

4,522,456

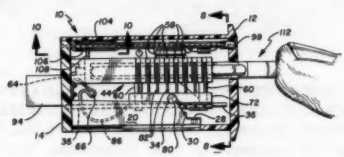
ELECTRONIC TAG RECEPTACLE AND READER

William H. Wehrmacher, Prior Lake, Minn., assignor to Datakey, Inc., Burnsville, Minn.

Filed Jan. 25, 1984, Ser. No. 573,649

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—17 R **29 Claims**



1. An electrical receptacle, actuated by insertion of a device carrying electrical contacts, which comprises:

a housing;

article support means in the housing for receiving and holding the inserted device;

actuator means including abutment means positioned in the housing so as to be contacted by the inserted device;

a receptacle contact carrier assembly including electrical contacts, the assembly being swingably and reciprocably mounted in the housing;

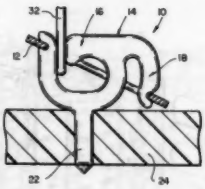
means actuably connecting the carrier assembly to the actuator means such that a device inserted into the device support means and urged against the actuator abutment means causes reciprocable movement of the carrier assembly and swinging movement of the electrical contacts thereon into engagement with the electrical contacts on the inserted device, and

means for establishing electrical connection to the receptacle electrical contacts.

4,522,457
COMPLIANT CONNECTING DEVICE WITH HEAT-RECOVERABLE DRIVER

Thomas H. McGaffigan, Redwood City, and Harold B. Kent, San Carlos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 7, 1983, Ser. No. 539,870
Int. Cl.³ H01R *13/20*
U.S. Cl. 339—30 **9 Claims**



1. A reusable connecting device comprising:

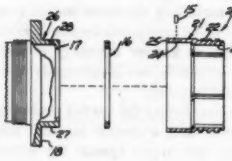
a resilient socket to receive and to provide high contact force with an object to be connected, said socket having a biasing portion and a sequentially operating overload portion, said portions capable of being moved inwardly and when so moved to exert an outward force, the biasing portion including two opposed legs for gripping the object to be connected about its axis and the overload portion comprising a resilient arm extending from one of said legs transversely away from the axis of the object to be gripped; and

a heat-recoverable metallic driver connected to the socket, the metal of said driver having a martensitic state and an austenitic state, said driver capable of being expanded dimensionally by an outward force exerted by the biasing and overload portions of the socket when said driver is in its martensitic state, a change from its martensitic state to its austenitic state recovering said driver to its non-expanded dimension, initially moving the biasing portion inwardly until it contacts an object to be inserted within the socket, providing a high contact force with such an object, the overload portion subsequently moving inwardly after the biasing portion is unable to move, further providing a large range of dimensional compliance and acting as an overload mechanism when movement of the biasing portion is limited.

4,522,458
ELECTRICAL CONNECTOR ASSEMBLY HAVING A FORCE ACTUATED RELEASING ARRANGEMENT

Dee A. Werth, Bainbridge, and Vincent A. Luca, Jr., Sidney, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 11, 1983, Ser. No. 493,486
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—45 M **2 Claims**



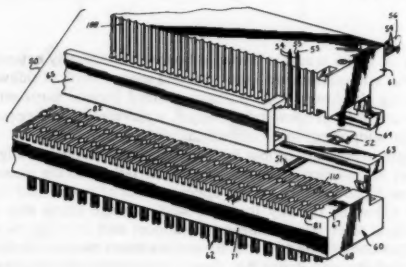
1. An electrical connector assembly including a force actuated releasing arrangement, said electrical connector assembly comprising interconnected plug and receptacle components and said force actuated releasing arrangement releasably connecting said components together and comprising coaxial sleeves carried about said plug component with one of said sleeves being connected to the receptacle component and adapted to move radially and disconnect therefrom upon application of a first external axial force and another of said sleeves being adapted to move longitudinally of said one sleeve upon application of said first external axial force, said force actuated releasing arrangement further characterized by:

one of said components comprising a pair of generally cylindrical shell portions interfitted with one another and a pin extending between the shell portions and having its opposite ends received, respectively, in the two shell portions, said pin having a cross-sectional area adapted to shear upon application of a second external axial force, said second external axial force being greater than said first external axial force.

4,522,459
SYSTEMS FOR AND METHODS OF MAKING ELECTRICAL CONNECTIONS

Edwin C. Hardesty, Perry Hall, and Erle M. Hutchins, Bel Air, both of Md., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 331,731, Dec. 17, 1981, abandoned.
This application Jun. 1, 1984, Ser. No. 615,690
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—98 **18 Claims**



1. A system for connecting electrically conductors of a first group with corresponding conductors of a second group, said system comprising:

a base which is made of a dielectric material and which includes a plurality of parallel grooves formed across one surface thereof for receiving individually the conductors of the first group, said base having a plurality of rows of apertures transverse of said grooves with adjacent apertures between said rows being staggered with respect to each other and with each of said apertures communicating with an associated groove;

a plurality of contact elements which are made of an electrically conductive material with each being positioned in an associated one of said apertures for establishing an electrical connection between conductors of the two groups, each contact element capable of being moved slidably in its associated aperture and comprising a tubular member having surfaces that define a conductor-receiving slot opening to and being aligned with the groove of said base that communicates with the aperture in which said each contact element is positioned, the slot being configured and the tubular member having sufficient stiffness to cause at least portions of the surfaces that define the slot to nick each conductor that is caused to be moved into and along the slot with any accompanying deflection of said surfaces being substantially negligible, and one end of each said contact element including a peripheral edge which has at least a portion thereof diametrically opposite to the conductor-receiving slot provided with a cutting edge that is

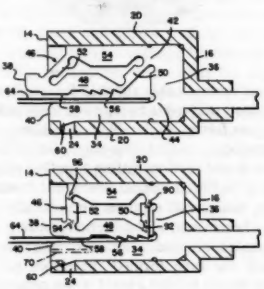
effective to sever conductors that extend past the peripheral edge and that are moved into the slot; and

means capable of being assembled to said base and of cooperating with said contact elements as said contact elements are moved within said associated apertures in said base for causing each conductor of the first group and a corresponding conductor of the second group which is aligned with each of said grooves to be moved into the slot of the contact element which is positioned in the associated aperture.

4,522,460
CONNECTING MEANS FOR CLOSELY SPACED CONDUCTORS

Hoy S. Beck, Jr., Lexington, and John R. Shoemaker, Reidsville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1983, Ser. No. 561,858
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—99 R **6 Claims**



1. A preloaded electrical connecting device for use with elongated conductors is comprised of an insulating housing having one or more electrical contact terminals therein, the housing having an elongated conductor receiving face, an oppositely facing conductor entry face, oppositely facing parallel sidewalls, and oppositely facing parallel endwalls extending between the faces, and an elongated carrier receiving slot, the slot being essentially parallel to the endwalls and extending rearwardly onto the housing from the elongated conductor receiving face, a plurality of terminal receiving cavities extending through the housing from the elongated conductor receiving face to the conductor entry face essentially parallel to the sidewalls with at least one of the cavities having an electrical contact terminal therein, the device being characterized in that:

each contact terminal is a flat one piece stamped sheet metal member having an elongated conductor connecting means at one end,

the connecting means has first and second jaw members and a throat portion, the jaw members having free ends and fixed ends, the fixed ends being spaced from each other and attached to the throat portion, the free ends being spaced from each other, and movable toward each other,

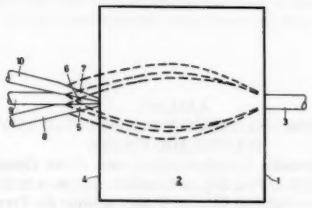
the free end of the first jaw member further having a portion that extends outwardly from the elongated conductor receiving face of the housing whereby,

upon placing the elongated conductor between the first and second jaw members and applying a deforming force to the free end of the first jaw member, the outwardly extending portion of the first jaw member is moved into the housing until the portion is flush with the front face and the first jaw member is moved into clamping engagement with the conductor and second jaw member, thus establishing electrical contact with the conductor.

4,522,461
OPTICAL MULTIPLEXER

Lothar Mannschke, Eckenhaid-Eckental, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,105
Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218023
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.18 **8 Claims**



1. An optical multiplexer comprising:

a graded-index rod lens having a first end face and a second opposed end face;

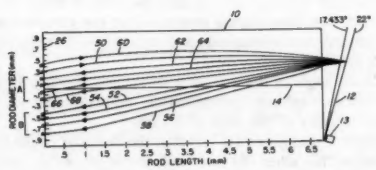
an output lightwave conductor positioned at said second end face;

a plurality of input lightwave conductors merging onto said first end face of said graded-index rod lens, each said input lightwave conductor having a tapered portion at the end thereof, the tips of the tapered end portions centrally abutting said first end face of said graded-index rod lens, light transmitted from said tips passing through said graded-index rod lens to said output lightwave conductor.

4,522,462
FIBER OPTIC BIDIRECTIONAL WAVELENGTH DIVISION MULTIPLEXER/DEMULTIPLEXER WITH TOTAL AND/OR PARTIAL REDUNDANCY

Scott F. Large, Billerica, and Bruce D. Metcalf, Burlington, both of Mass., assignors to The Mitre Corporation, Bedford, Mass.

Filed May 27, 1983, Ser. No. 498,660
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.19 **6 Claims**



1. Wavelength division multiplexer/demultiplexer with path and terminal equipment redundancy comprising:

a gradient index of refraction (GRIN) lens having an optical axis;

a diffraction grating located adjacent to one end of said GRIN lens, said diffraction grating adapted for switching from a first angle to a second angle with respect to said GRIN lens optical axis;

first and second input optical fibers located at first and second input locations on the other end of said GRIN rod lens; and

a first and a second plurality of output optical fibers located on said other end of said GRIN lens;

wherein optical energy will travel from said first input optical fiber to said first plurality of output optical fibers when said diffraction grating is oriented at said first angle and optical energy will travel from said second input optical fiber to said second plurality of output optical fibers when said diffraction grating is oriented at said second angle.

4,522,463

DEVICE FOR RELEASABLY CONNECTING OPTICAL WAVEGUIDE FIBERS

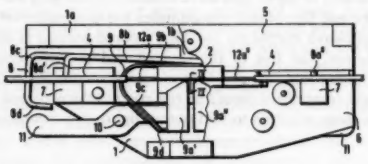
Gerhard Schwenda, Grosshabersdorf, and Alfred Orendt, Nuremberg, both of Fed. Rep. of Germany, assignors to Schiederwerk Gunter Schmidt KG Fabrik für Apparate der Fernmelde- und Elektrotechnik, Nuremberg, Fed. Rep. of Germany

Filed Jan. 4, 1983, Ser. No. 455,543

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201240

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **9 Claims**



1. In a connector device for releasably connecting the ends of optical waveguide fibers having an alignment means into which the ends of the fibers are inserted including a V-shaped groove in the connector and clamping means which clamps said ends in place by continuously pressing the ends of the fibers into the groove, the improvement comprising:

an opening for the V-shaped groove through which the fibers are inserted for entry into the groove extending the full length of the groove so that the path of entry for the ends of the fibers during insertion into the groove is perpendicular to the longitudinal direction in which the fibers and groove are orientated;

the vertex angle of the groove is orientated laterally so that its bisector extends approximately perpendicular to said path of entry of the ends of the fiber;

the depth of said groove is less than the diameter of the fiber ends, so that when the fiber ends are in place they extend out of the groove in the direction of said bisector and can be observed;

two clamping elements for each fiber end operatively mounted on the connector device for releasably clamping a respective fiber end, one of said clamping elements being located adjacent the end face of the respective fiber and the other clamping element being spaced at a distance remote from the fiber end; and

at least one actuating member operatively associated with said two clamping elements for each fiber end for actuating said two clamping elements between clamping and non-clamping positions.

4,522,464

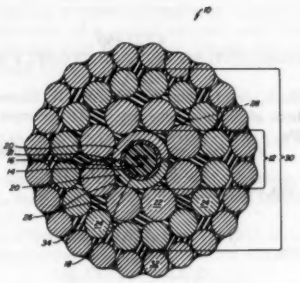
ARMORED CABLE CONTAINING A HERMETICALLY SEALED TUBE INCORPORATING AN OPTICAL FIBER

Robert E. Thompson, Ronoake; Gordon Gould, Great Falls, both of Va., and Charles I. Soodak, Silver Spring, Md., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 17, 1982, Ser. No. 408,972

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.23 **44 Claims**



1. An armored optical cable suitable for use in an environment which subjects said cable to repeated longitudinal elongation and relaxation forces, said cable comprising:

a central hermetically sealed tube core, said core comprising at least two metal sections fitting together around one or a plurality of buffered optical fibers and forming a cylindrical tube, said metal sections hermetically joined into said tube, wherein said metal sections were preshaped by rolling from an anealed wire, and wherein said metal sections and the tube formed therefrom are fabricated from metals which exhibit a yield strain greater than about 0.85;

at least six substantially solid elements wound helically around said core in a given handedness;

at least twice the number of said at least six elements of inner armor wires wound around and contacting said at least six elements of the same handedness in a unilay helical configuration, said at least six elements and said inner armor wires being fabricated around said core at the same time wherein the elements and the wires of the same handedness and the core form a central bundle; and

a plurality of outer armor wires contacting said inner armor wires, said out armor wires wound in an opposite helical handedness to the handedness of said inner armor wires such that the torques exerted by said inner armor wires and said outer armor wires substantially balanced.

4,522,465

OPTICAL FIBER COATED WITH AN ULTRAVIOLET CURED TOPCOATING

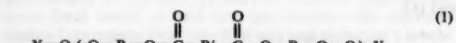
Timothy E. Bishop, Arlington Heights, and George Pasternack, Lincolnshire, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 10, 1983, Ser. No. 550,443

Int. Cl.³ G02B *5/16*

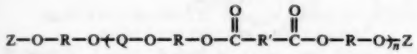
U.S. Cl. 350—96.30 **12 Claims**

1. A resin buffer-coated and topcoated optical glass fiber in which the topcoat is an ultraviolet cured coating of an ultraviolet curable coating composition which, when formed into a 3 mil cured test film, has a tensile modulus measured at room temperature of at least 150,000 psi. and an elongation at least about 15%, said composition comprising, based on total reactive components, from 30% up to about 80% of diethylenic polyester polyurethane having one of the following formulas:



(1)

in which X is the residue of a monoethylenically unsaturated monohydric alcohol, Q is the residue of an organic diisocyanate, R is an alkylene group containing from 2–4 carbon atoms, R′ is an alkylene group containing from 2–8 carbon atoms, and n is a number from about 1.8 to about 4; and



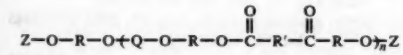
(2)

in which the symbols have the above assigned meanings and Z is a monoisocyanate-functional monoethylenically unsaturated compound; at least 5% of total reactive components of liquid diethylenically unsaturated ester of a diglycidyl ether of a bisphenol, and at least 5% of total reactive components of liquid monoethylenically unsaturated monomer having a glass transition temperature above about 55° C.

10. A method of topcoating resin buffer-coated optical glass fiber to provide a topcoat having the high strength and modulus combined with good elongation and solvent resistance associated with extruded jacket coatings, but which is applied by ordinary coating procedures and cured by exposure to ultraviolet radiation comprising, applying to resin buffer-coated optical glass fiber an ultraviolet-curable coating composition comprising, based on total reactive components, from 30% up to about 80% of diethylenic polyester polyurethane having one of the following formulas:

(1)

in which X is the residue of a monoethylenically unsaturated monohydric alcohol, Q is the residue of an organic diisocyanate, R is an alkylene group containing from 2–4 carbon atoms, R′ is an alkylene group containing from 2–8 carbon atoms, and n is a number from about 1.8 to about 4; and



(2)

in which the symbols have the above assigned meaning and Z is a monoisocyanate-functional monoethylenically unsaturated compound; at least 5% of total reactive components of liquid diethylenically unsaturated ester of a diglycidyl ether of a bisphenol, and at least 5% of total reactive components of liquid monoethylenically unsaturated monomer having a glass transition temperature above about 55° C., and then exposing the wet-coated fiber to ultraviolet light to cure the coating.

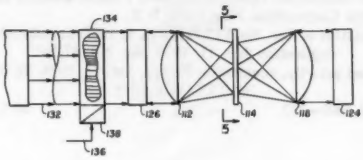
4,522,466

RECURSIVE OPTICAL FILTER SYSTEM

Charles E. Lindig, Huntington Bay; Robert W. Brandstetter, Levittown, and Adrian R. Doucette, Garden City, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 26, 1983, Ser. No. 498,462
Int. Cl.³ G02B 5/22; G06G 9/00
U.S. Cl. 350—162.12 **27 Claims**

1. A recursive optical filter system comprising: a source which produces a substantially coherent, collimated beam of optical radiation; optical filtering means including means for producing an optical Fourier transform, an optical filter, and means for producing an optical inverse Fourier transform; recursive means for directing said beam in a manner to traverse said optical filtering means a plurality of times, and means for extracting said beam for utilization, the recursive passage of



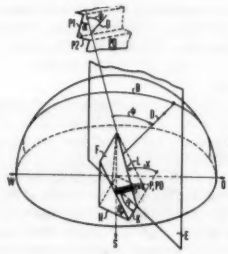
said beam through said filtering means resulting in an efficient attenuation of unwanted spectral components of said beam.

4,522,467

WINDOW HAVING SUNSHADE PRISMATIC BARS

Christian Bartenbach, Rinnerstrasse 39, A-6020 Innsbruck-Aldrans, Austria

PCT No. PCT/DE82/00203, § 371 Date May 20, 1983, § 102(e) Date May 20, 1983, PCT Pub. No. WO83/01085, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 20, 1982, Ser. No. 504,059
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138270; Jul. 20, 1982, 3227118
Int. Cl.³ G02B 27/00
U.S. Cl. 350—263 **5 Claims**

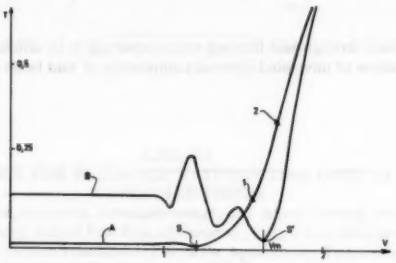


1. A window, comprising: a plane of the window being provided at a prescribed angle of inclination (β) with the horizontal; a prismatic plate disposed parallel to the window plane and which exhibits a planar base surface toward an outside of the window and solid prismatic rods next to and parallel to one another as an integral part of the plate at an inside of the window, said prismatic rods extending over an entire opening of the window; an unmirrored face of each prismatic rod enclosing an acute base angle (α) with the base surface; a mirrored face of each prismatic rod being provided and being perpendicular to the unmirrored face; the prismatic rods being disposed such that a point of an angle of elevation (ψ) of solar rays measured relative to the window plane in a reference plane perpendicular thereto points to the mirrored face given a highest solar altitude to be blocked out; and the base angle (α) between the unmirrored face and the base surface of each prismatic rod being selected of such magnitude that the window transmits substantially no sunbeams in an exclusion time interval on a prescribed reference day.

4,522,468
INFORMATION DISPLAY DEVICE HAVING A LIQUID CRYSTAL CELL

Michel Goscianski, Limeil-Brevannes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 812,717, Jul. 5, 1977, abandoned. This application Jun. 11, 1979, Ser. No. 47,393
Claims priority, application France, Jul. 13, 1976, 76 21497
Int. Cl.³ G02F 1/13
U.S. Cl. 350—332 20 Claims



1. An information display device comprising a display cell including a nematic liquid crystal and electrodes at opposite sides of said nematic liquid crystal, means for applying at least a minimum voltage Vm between said electrodes, said minimum voltage Vm being greater than the threshold voltage at which polarization of light begins to be influenced in said cell, and means including polarization means for obtaining minimum optical transmission of said cell at said minimum voltage Vm.

4,522,469
LIQUID CRYSTAL LIGHT VALVE STRUCTURES

N. John Koda, Vista, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 9, 1984, Ser. No. 569,372
Int. Cl.³ C23C 15/00
U.S. Cl. 350—342 12 Claims

1. In a process for the production of a photosensor film to be incorporated into a liquid crystal light valve, said film and light valve characterized by improved low negative memory, and wherein the photosensor film is prepared by radio frequency sputter depositing CdS onto a suitable substrate in a plasma vapor of argon containing minor amounts of H_2S, the improvement comprising introducing, during the sputtering process, nitrogen in the amount of not more than about 1% of the plasma vapor while maintaining the substrate ambient temperature in the range of from about 130° C. to about 200° C. and annealing the resultant photosensor film in an inert atmosphere at temperatures in the range of from about 300° C. to about 425° C.

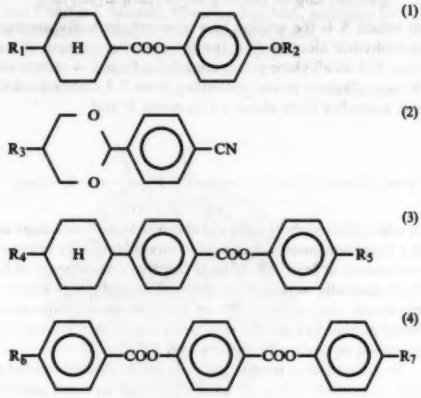
10. A liquid crystal light valve having a layered structure with the layers comprising, in sequence, glass, an ITO layer, a CdS photosensor layer, an opaque light blocking layer, a multilayered dielectric film, a liquid crystal layer, an ITO layer and glass, wherein the CdS photosensor layer is produced by the process of claim 1.

4,522,470
LIQUID CRYSTAL COMPOSITION AND DISPLAY DEVICE

Chiyoaki Iijima, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan

Filed Jul. 5, 1983, Ser. No. 510,850
Claims priority, application Japan, Jul. 5, 1982, 57-116492
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 350—350 R 26 Claims

1. A liquid crystal composition comprising at least one of each of compounds represented by the formulas (1), (2), (3), and (4):

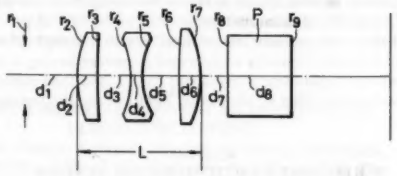


wherein, R_1 is a straight-chain alkyl group having 3 to 6 carbon atoms; R_2 is a straight-chain alkyl group having 1 to 6 carbon atoms; R_3 is a straight-chain alkyl group having 2 to 5 carbon atoms; R_4 is a straight-chain alkyl group having 3 to 5 carbon atoms; R_5 is a straight-chain alkyl group having 1 to 7 carbon atoms; R_6 is a straight-chain alkyl group having 3 to 5 carbon atoms; and R_7 is a straight-chain alkyl group having 1 to 5 carbon atoms, and wherein compound (1) is present between about 40 to 70% by weight, compound (2) is present between about 25 to 45% by weight, compound (3) is present between about 3 to 15% by weight, and compound (4) is present between about 3 to 15% by weight of the composition.

4,522,471
ADAPTER LENS SYSTEM FOR USE WITH PHOTOGRAPHIC CAMERAS

Kimihiko Nishioka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1983, Ser. No. 523,053
Claims priority, application Japan, Aug. 20, 1982, 57-143343
Int. Cl.³ G02B 9/16
U.S. Cl. 350—449 6 Claims



1. An adapter lens system for use with photographic cameras comprising a first positive lens element, a second biconcave lens element, and a third positive lens element and a stop arranged on the front side of said lens elements, said lens system satisfying the following condition:

(1) $f_B > 0.85f$
(2) $L < 0.35f$
(3) $f_1 > 0.5f$
(4) $0.06f \leqq d_3$
(5) $\nu_1 < 45$
(6) $d_5 \geqq 0.05f$

wherein the reference symbol L represents total length of said

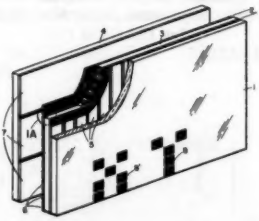
lens system as a whole, the reference symbol f_B designates back focal length of said lens system, the reference symbol f_1 denotes focal length of said first lens element, the reference symbol f represents focal length of said lens system as a whole, the reference symbol d_3 designates airspace reserved between said first and second lens elements, the reference symbol d_5 denotes airspace reserved between said second and third lens elements and the reference symbol ν_1 represents Abbe's number of said first lens element.

4,522,472

ELECTROPHORETIC IMAGE DISPLAY WITH REDUCED DRIVES AND LEADS

Richard B. Liebert, Ridgefield, Conn., and Roger P. White, Yonkers, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,466
Int. Cl.³ G02F *1/01*
U.S. Cl. 350—362 **14 Claims**



1. An electrophoretic display device comprising first and second oppositely disposed substrates with at least one of said substrates being transparent,

a plurality of first electrodes disposed at a facing surface of said first substrate,

a plurality of second electrodes disposed on a dielectric structure adjacent to said first electrodes,

means for connecting equal numbers of at least said first electrodes in parallel,

an electrophoretic fluid containing a plurality of charged pigment particles disposed between said first and second substrates,

a plurality of third electrodes disposed on a facing surface of said second substrate, each of said plurality of third electrodes being opposite to a number of said plurality of first and second electrodes, and

means for alternatively applying an enabling voltage bias value on one of said third electrodes and means for maintaining a lower voltage bias value on remaining ones of said third electrodes.

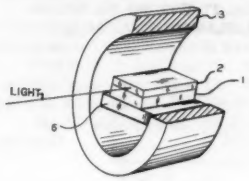
4,522,473

FARADAY ROTATOR FOR AN OPTICAL DEVICE

Taketoshi Hibiya; Yoshinori Ohta, and Koichi Matsumi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,230
Claims priority, application Japan, Mar. 27, 1981, 56-45195; Sep. 28, 1981, 56-153253; Sep. 28, 1981, 56-153254; Sep. 28, 1981, 56-153255
Int. Cl.³ G01B *9/02*; G01P *9/00*
U.S. Cl. 350—377 **11 Claims**

1. A Faraday rotator comprising: a non-magnetic garnet substrate; a ferrimagnetic garnet film epitaxially grown on the substrate; a light beam impinging upon a surface at an end of said film; and a magnet for inducing a magnetic field parallel to the top surface of said film for rotating a plane of polarization within said film of said light-beam impinging upon said film, said substrate and said film being made of a material having a predetermined absolute value of the difference $\Delta a = a_s - a_f$ between the lattice constant a_s of said substrate and the lattice



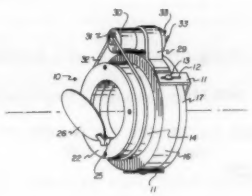
constant a_f of said film, said predetermined absolute value being no greater than 0.001 Å (angstrom).

4,522,474

SPINNING OPTICS DEVICE

Sidney H. Slavin, 9505 Carterwood Rd., Richmond, Va. 23229

Filed May 20, 1980, Ser. No. 151,585
Int. Cl.³ G02C *1/00*; A61B *3/00*
U.S. Cl. 351—203 **11 Claims**



1. A system for conditioning the eye comprising in combination:

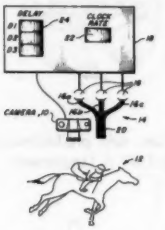
spinning sight altering means placed adjacent a person and in registry with a person's field of vision,

means for altering the direction, rate and duration of said spinning sight altering means, and a trail lens clip placed in registry with the person's field of vision and placed adjacent said spinning sight altering means whereby further conditioning and influencing of the vision field of the person so treated can be afforded wherein said spinning sight altering means includes a drive means controlled by a control circuit including a memory, a program in said memory corresponding to a sequence of operations to direct said drive means, said means for altering the direction, rate and duration having an output for providing a series of pulses corresponding to said program, means for feeding said pulses to said drive means to rotate said spinning sight altering means wherein said spinning sight altering means, said means for altering direction, rate and duration, and said trial lens clip are placed before each eye of the person in registry with the person's field of vision, and said drive means and control circuit are adapted to alter and influence the field of vision and perception of each person's eye independently one of the other, including means for detecting the position of a person's eye for which said system is to be used, and operatively connected to said means for altering direction, rate and duration to initiate the training as a function of eye movement.

4,522,475
APPARATUS AND METHOD FOR SHOWING MOTION IN A SINGLE PHOTOGRAPH

John P. Ganson, 14 Lincoln Rd., Wayland, Mass. 01778

Filed Dec. 27, 1983, Ser. No. 565,343
Int. Cl.[3] G03B *19/18, 21/32*
U.S. Cl. 352—39 14 Claims



1. Apparatus for color photography of a scene including a moving subject comprising, in combination,

a camera having film capable of differentiating between components of a spectrum,

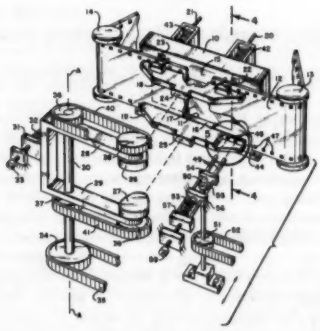
a light source for illuminating the subject comprising a plurality of individual light units each adapted to emit a light flash primarily in a distinct portion of said spectrum, and

a flash interval control connected to each of said individual light units and adapted to actuate said individual light units successively after predetermined time intervals.

4,522,476
MOTION PICTURE FILM GATE AND REGISTRATION SYSTEM

Walter Renold, 7044 Mary Ellen Ave., North Hollywood, Calif. 91603

Filed Jun. 25, 1984, Ser. No. 624,462
Int. Cl.[3] G03B *1/48*
U.S. Cl. 352—225 17 Claims



1. A motion picture film gate and registration system for motion picture film that is intermittently transported through the gate from one frame to the next, including, in combination:

(a) a gate having an aperture with solid marginal edge areas;

(b) pressure pad means;

(c) means for moving said pressure pad means towards said gate to press marginal edges of said film against said solid marginal edge areas so as to hold the film firmly during the dwell time of the film in said aperture and moving said pressure pad means away from said marginal edges of said film to permit transport of the film to the next frame, said film including perforations along its marginal edges and a part of said pressure pad means including at least one opening for registration with a perforation during the dwell time of said film;

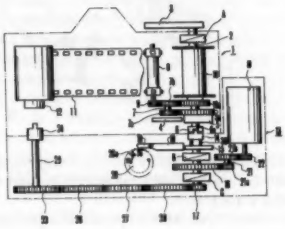
(d) registration pin means movable into and out of said opening and registering film perforation so that successive film frames are indexed to consistent positons in said gate after coming to rest at the end of the transport period, said pressure pad means stripping the film perforation from said registration pin means when said registration pin means is withdrawn; and

(e) means for lifting away said film from the plane of said aperture prior to transport of the film, to prevent scratching of the film during transport.

4,522,477
ELECTRIC MOTOR DRIVE DEVICE FOR CAMERA

Tomonori Iwashita, Tokyo, and Hidehiko Fukahori, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 322,226, Nov. 17, 1981, abandoned.
This application Aug. 31, 1983, Ser. No. 528,237
Claims priority, application Japan, Nov. 25, 1980, 55-168661
Int. Cl.[3] G03B *1/12*
U.S. Cl. 354—173.1 2 Claims



1. An electric motor drive device for a camera, comprising:

(a) a motor having an output shaft;

(b) a driving gear supported in a freely rotatable manner on a support shaft different from said output shaft, said driving gear being rotated in a first direction by rotation of said motor in a first normal direction and being rotated in a second direction by rotation of said motor in a reverse direction;

(c) a winding transmission member supported in a freely rotatable manner at said support shaft, said winding transmission member enabling said camera to effect a winding operation by rotation of said motor;

(d) a charge cam supported at said support shaft so as to rotate integrally with said winding transmission member, with rotation of said charge cam operating to effect charging of a mechanism provided at said electric drive device by rotation;

(e) a first one-way clutch to transmit the rotation of said driving gear to said winding transmission member when said driving gear rotates in said first direction, said first one-way clutch being supported at said support shaft in such a manner as to intervene between said driving gear and said winding transmission member;

(f) a rewinding transmission member to enable said camera to effect a rewinding operation upon rotation of said motor;

(g) a rewinding gear supported at said support shaft in a freely rotatable manner, with rotation of said rewinding gear being transmitted to said rewinding transmission member; and

(h) a second one-way clutch to transmit the rotation of said driving gear to said rewinding gear when said driving gear rotates in said second direction, said second one-way

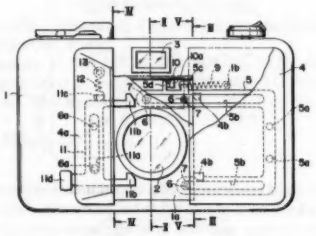
clutch being supported at said support shaft in such a manner as to intervene between said driving gear and said rewinding gear.

4,522,478

COVER-EQUIPPED CAMERA

Toru Kando, and Keisuke Haraguchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,238
Claims priority, application Japan, Apr. 23, 1982, 57-53430[U]
Int. Cl.³ G03B *17/04, 17/02*
U.S. Cl. 354—288 6 Claims



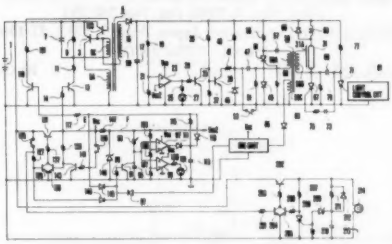
1. A cover-equipped camera comprising:
a camera body including a view finder and a photographic lens;
a cover consisting of a fixed cover fixed to the camera body and a movable cover adapted to move laterally between a closed position where the view finder and photographic lens is covered by said fixed and movable covers and an opened position where the view finder and the lens are exposed between the fixed and movable covers;
slider guide member support means projecting from the camera body and a sliding member provided on the movable cover and engaged with said support means to allow said lateral sliding movement of the movable cover, and wherein the sliding guide member is of a flattened U-shaped form and the straight portions of which are laterally run outside the lens, and the slider member support means comprises a collar adapted to be fitted into the flattened portions of the sliding guide member;
means for constantly urging the movable cover towards the opened position;
an engaging mechanism adapted to hold the movable cover at the closed position and comprising engaging projection means provided on the movable cover;
a lock lever arranged on said fixed cover and adapted to engage with the engaging projection means when the movable cover is at the closed position;
means to constantly bias said lock lever to the engaged position;
an operating lever adapted to release the engagement between the engaging projection means and the lock lever when shifted against the biasing force; and
means for stopping the movable cover at the opened position.

4,522,479

FLASH APPARATUS WITH POWER SUPPLY CONTROL DEVICE

Masanori Yamada, and Ryoichi Yoshikawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,616
Claims priority, application Japan, Dec. 27, 1982, 57-196728; Jan. 19, 1983, 58-6119; Jan. 19, 1983, 58-6120
Int. Cl.³ G03B *15/05;* H05B *41/26*
U.S. Cl. 354—413 20 Claims



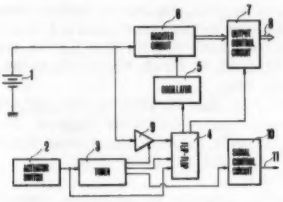
1. A flash apparatus comprising:
(a) a timer circuit having an initial state and arranged to begin to operate when a power switch is closed;
(b) means for stopping at least the operation of a DC-DC converter in response to expiration of the timer time of said timer circuit;
(c) manually operable reset means for resetting the operation of said timer circuit into the initial state; and
(d) advance notice giving means connected to the output terminal of said timer circuit to give a notice of the approaching end of said timer time.

4,522,480

BATTERY VOLTAGE CHECKING DEVICE FOR CAMERAS

Takashi Kawabata, Kanagawa; Nobuhiko Shinoda, and Shinji Sakai, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 374,527, May 3, 1982, abandoned, which is a continuation of Ser. No. 241,390, Mar. 6, 1981, abandoned. This application Apr. 12, 1984, Ser. No. 599,210
Claims priority, application Japan, Mar. 10, 1980, 55-30071
Int. Cl.³ G03B *17/18*
U.S. Cl. 354—468 15 Claims



1. A battery voltage checking device for a camera including:
(a) a booster circuit having an input and an output for increasing a voltage applied to the input when said booster circuit is actuated;
(b) connect means for transmitting an output voltage of a battery to the input of said booster circuit;
(c) a load circuit arranged to be supplied with electrical power by the voltage at the output of said booster circuit;

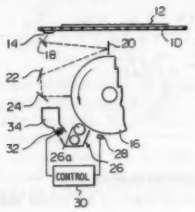
(d) a sensing circuit for sensing the voltage level of the battery and for providing a sensed output; and
(e) a control circuit for allowing the sensed output of said sensing circuit to be processed after a predetermined time from the actuation of said booster circuit.

4,522,481

TONER SUPPLY CONTROL METHOD FOR ELECTROPHOTOGRAPHIC COPIER

Chikara Imai, Tokyo, and Yasushi Koichi, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 3, 1983, Ser. No. 548,592
Claims priority, application Japan, Nov. 9, 1982, 57-196601
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **10 Claims**



1. A method of controlling supply of a toner in an electrophotographic copying machine including a photoconductive element and a developing unit which is applied with a bias voltage for development, said method comprising the steps of:
(a) providing a reference pattern having a predetermined reflectively;
(b) forming a latent image associated with said reference pattern electrostatically on a surface of the photoconductive element;
(c) setting a fatigue standard which is based on a fatigue characteristic of the photoconductive element;
(d) varying the bias voltage applied to the developing unit in response to the fatigue standard;
(e) developing the latent image on the photoconductive element into a toner image;
(f) detecting a degree of deposition of the toner on the toner image; and
(g) controlling the supply of the toner to the developing unit in response to the detected degree of toner deposition.

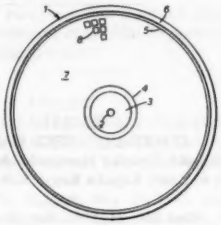
4,522,482

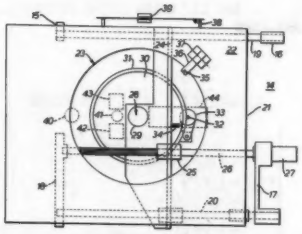
INFORMATION STORAGE AND RETRIEVAL

Robert M. Pettigrew, Foxton; John D. Bradbrook; Alan M. Smith, both of Royston, and John H. Fisher, Whaddon, all of England, assignors to Comtech Research, United Kingdom

PCT No. PCT/GB82/00179, § 371 Date Feb. 14, 1983, § 102(e) Date Feb. 14, 1983, PCT Pub. No. WO82/04489, PCT Pub. Date Dec. 23, 1982
PCT Filed Jun. 15, 1982, Ser. No. 467,479
Claims priority, application United Kingdom, Jun. 15, 1981, 8118329; Jul. 23, 1981, 8122737; Jun. 1, 1982, 8215982
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **60 Claims**

1. A recording apparatus for recording optically readable images on a storage member comprising recording material by means of which such images can be recorded on the member, the apparatus comprising processing means for recording said images on the storage member, the processing means having imaging means for imaging data to be recorded onto the storage member, and the apparatus also comprising drive means for producing relative motion between the imaging means and the storage member so that an image can be directed at a desired location of the storage member, and control means for controlling the drive means to enable an image to be recorded at any desired one of a plurality of areas of a two-dimensional array of areas in a first zone of the storage member, the control means comprises means for reading co-ordinate defining positional information conveyed by the storage member in a second zone to ascertain a datum position for a first co-ordinate





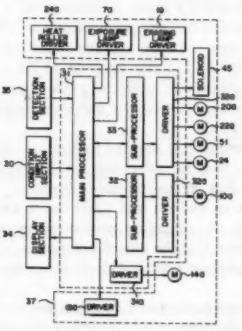
and for a second co-ordinate of a two-dimensional co-ordinate system in which each of said areas has its own two-dimensional co-ordinate address; and said control means comprising measuring means for measuring relative displacements in the two co-ordinate directions to establish co-ordinate addresses relative to the datum positions of the co-ordinates.

4,522,483

IMAGE FORMING APPARATUS

Hiroshi Matsumoto, and Junji Watanabe, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 5, 1983, Ser. No. 520,645
Claims priority, application Japan, Aug. 10, 1982, 57-138035
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**



1. An image forming apparatus comprising:
photoconductive means disposed to be movable;

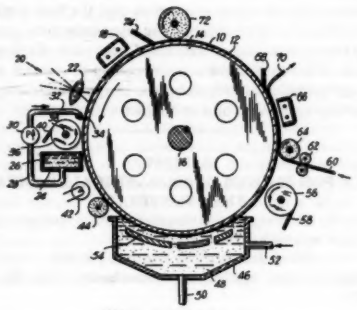
driving means for driving said photoconductive means;
charging means, disposed near said photoconductive means, for charging said photoconductive means;
exposure means for exposing said photoconductive means to form a latent image corresponding to a document pattern on said photoconductive means;
developing means for developing the latent image on said photoconductive means into a visible image;
transfer means for transferring the visible image onto a paper sheet;
cleaning means, disposed in contact with said photoconductive means, for removing residual toner material left on said photoconductive means; and
drive signal supplying means for supplying drive signals to said driving means so as to set said photoconductive means in different driving conditions for an image forming mode and an image forming standby mode, respectively.

4,522,484

ELECTROPHOTOGRAPHIC APPARATUS FOR INCREASING THE APPARENT SENSITIVITY OF PHOTOCONDUCTORS

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Continuation of Ser. No. 97,519, Nov. 26, 1979, abandoned, which is a division of Ser. No. 908,355, May 22, 1978, Pat. No. 4,256,820. This application Apr. 11, 1983, Ser. No. 482,275
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 DD **7 Claims**



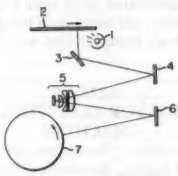
5. Apparatus for making an electrophotocopy of an original document including in combination a photoconductor, means for charging the photoconductor to a predetermined potential, means for exposing the charged photoconductor to an optical image of the document to produce a first latent electrostatic image, the exposure being sufficiently brief that background areas of the latent image are discharged to a first potential appreciably exceeding half said predetermined potential, first means for developing the first latent image with a masking material comprising optically opaque charged particles, the first developing means including an electrode biased to a first voltage, means for uniformly illuminating the first developed image to discharge said background areas to a second potential which is less than said first potential and produce a second latent image, means for removing masking material from the second latent image, second means for developing the unmasked second latent image with a developer comprising charged toning particles, the second developing means including an electrode biased to a second voltage which is less than said first voltage.

4,522,485

COPYING MACHINE INCLUDING A DIELECTRIC COVERED METAL REFLECTIVE DEVICE

Osamu Kamiya, and Nobuyuki Sekimura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 195,491, Oct. 9, 1980, abandoned, which is a continuation of Ser. No. 30,855, Apr. 17, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 429,145
Claims priority, application Japan, Apr. 24, 1978, 53-48510; Nov. 6, 1978, 53-136408
Int. Cl.³ G03G *15/04*
U.S. Cl. 355—11 **14 Claims**



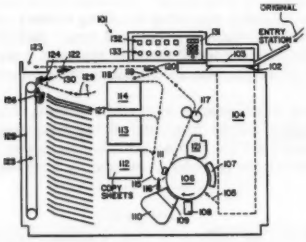
1. A copying machine comprising an original table on which an original to be copied is laid; a lens system; a photosensitive medium which has characteristics of high sensitivity to light in a certain wavelength range; a light source for illuminating an object to be copied; and reflective means for reflecting light from the object to said photosensitive medium, said reflective means comprising a metal surface having a dielectric film provided thereon, wherein said dielectric film decreases the reflection factor of said metal surface for light of a wavelength to which said photosensitive member is highly sensitive, while retaining a relatively higher reflection factor for other light, and wherein said metal absorbs non-reflected light, so that the spectral wavelength characteristics of light coming from the light source match with the spectral sensitivity characteristics of said photosensitive medium.

4,522,486

METHOD AND APPARATUS FOR ADAPTIVE COLLATION

Gary A. Clark, Longmont; Frederick W. Johnson, Boulder, and Carl A. Queener, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,175
Int. Cl.³ G03G *15/00*; B65H *39/11*
U.S. Cl. 355—14 SH **14 Claims**



1. A method of operating a sheet collator to collate into actual bins sheet sets, comprising the steps of:
entering into a register the number of sheets contained in each sheet set,
indicating the sheet capacity of each actual bin,
inspecting said number entered in said register to produce a signal if it exceeds the indicated actual bin capacity,
grouping a plurality of adjacent actual bins together into a

virtual bin, upon the occurrence of said signal, such that the capacity of said virtual bin at least equals said entered number, and

collating a complete sheet set into said virtual bin.

8. Apparatus for assembling collated sets of copies made from a supplied set of originals, including:

a fixed number of copy-receiving bins each capable of storing no more than a fixed number of copies;

a selectable variable number of copy-receiving bin-groups, each bin-group being constituted of a number of adjacent bins, each bin-group capable of storing a collated set of copies;

a first source for supplying first signals representing the number of originals in the supplied set;

control means associated with said bins and first source, operative to select the number of bin-groups as a function of the first signals from the first source.

4,522,487

SEALING DEVICE FOR ELECTROSTATIC COPYING MACHINE

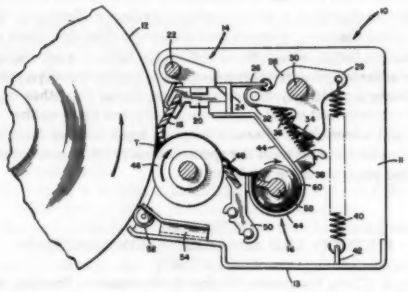
Norio Misawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 154,382, May 29, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,535

Claims priority, application Japan, Jun. 8, 1979, 54-78040

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **1 Claim**



1. In a cleaning device for removing residual toner particles from a photoconductive surface of an electrostatic copying machine, said cleaning device including a base plate, a toner particle removing device adjacent the base plate to remove residual particles from the photoconductive surface, a collecting roller rotatably supported in rolling contact with the photoconductive surface adjacent said toner particle removing device to transport toner particles removed from the photoconductive surface, and an enclosure, the improvement comprising:

a sealing roller separate from said collecting roller rotatably provided on the front end of the base plate in rolling contact with the photoconductive surface to prevent the residual toner particles from escaping from said enclosure.

4,522,488

CLEANING APPARATUS FOR A MAGNETOGRAPHIC PRINTING DEVICE

Almon P. Fisher, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1983, Ser. No. 563,854

Int. Cl.³ G03G *15/08*

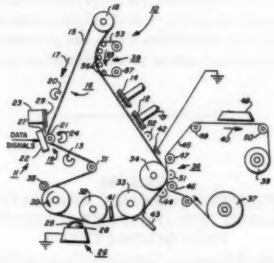
U.S. Cl. 355—15 **10 Claims**

1. An apparatus for cleaning residual toner particles from the recording surface of a flexible, image retentive member used in a printing device, the cleaning apparatus comprising:

a fixed base having a flat surface with an elongated nozzle opening therein, the base having opposing edges which are substantially perpendicular to the longer direction of the nozzle opening and opposing ends which are substantially parallel with the longer direction of the nozzle opening;

a vacuum source connected to the nozzle opening;

a layer of uniformly thick, non-conductive, woven material having interstices therein, the layer having parallel edges and being attached to the base flat surface, so that it covers the flat surface and the nozzle opening therein with the layer edges being perpendicular to said longer direction of the nozzle opening;



the recording surface of the image retentive member being moved in full sliding contact with the layer and in a direction parallel to the layer edges and perpendicular to the nozzle opening; and

seals being placed along the opposing edges of the layer and adjacent the base edges to form air seals between the moving image retentive member and the base surface, so that the flow of air through the layer interstices produced by the vacuum source is directed from each of the oposing ends of the base to the nozzle opening to remove residual toner particles dislodged by the image retentive member moving relative to and in contact with the layer.

4,522,489

DEVICE FOR PHOTOLITHOGRAPHICALLY TREATING A THIN SUBSTRATE

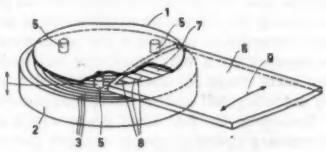
Adrianus G. Bouwer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,823

Claims priority, application Netherlands, Jan. 21, 1983, 8300220

Int. Cl.³ G03B *27/60*

U.S. Cl. 355—73 **6 Claims**



1. A device for photolithographically treating a thin substrate which is provided with a photosensitive layer on a major surface at the upper side of the substrate, which device comprises a pre-alignment station, a substrate table for holding the substrate during the photolithographic treatment and a transport arm which is provided with a vacuum connection for holding the substrate by suction at the lower side of the substrate during transport of the substrate from the pre-alignment

station to the substrate table, characterized in that the substrate table is provided with supporting means for the substrate which are adjustable in the direction of height and which have a supporting surface which is adjustable to a distance above the substrate table exceeding the thickness of the part of the transport arm which serves to hold the substrate, the supporting means being adjustable in a downward direction at least through a distance such that said supporting surface is level with the upper surface of the substrate table, and the supporting means being so positioned in the substrate table as to leave a space free for the movement of the transport arm above a part of the substrate table.

4,522,490

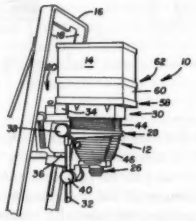
METHOD AND APPARATUS FOR ADAPTING PHOTOGRAPHIC ENLARGERS FOR USE WITH LARGE FORMAT NEGATIVES

Alan B. Ross, 206 Caledonia St., #17, Sausalito, Calif. 94965

Filed Nov. 16, 1983, Ser. No. 552,483

Int. Cl.³ G03B *27/58*

U.S. Cl. 355—75 **16 Claims**



1. An adapter assembly for use with enlargers of a type including a longitudinal frame means carrying relatively movable lens, negative and condenser stages arranged along an optical axis for focusing images of smaller format negatives upon photographic paper or the like, the lens stage being adapted for use with various lenses, the adapter permitting use of large format negatives with the original lens stage for similarly focusing images of large format negatives upon the photographic material or the like and comprising a first large format negative stage mounted on the condenser stage at a sufficient distance from the lens stage so that a larger format negative arranged in the large format negative stage is within a light cone established by the lens, a light source suitable for illuminating the large format negative being mounted on the first large format negative stage opposite the lens stage.

4,522,491

METHOD FOR REPRODUCING ONE OR MORE TARGET COLORS ON PHOTOGRAPHIC PAPER OR THE LIKE

Marjorie D. Ingalls, and Richard D. Ingalls, both of E. 1104 57th, Spokane, Wash. 99203

Division of Ser. No. 353,399, Mar. 1, 1982, Pat. No. 4,425,417, which is a continuation-in-part of Ser. No. 76,499, Sep. 17, 1979, abandoned, Continuation of Ser. No. 7,702, Jan. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 794,987, May 9, 1977, abandoned. This application Feb. 7, 1983, Ser. No. 464,637

Int. Cl.³ G03B *27/32, 27/52*

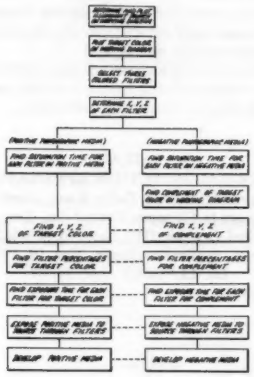
U.S. Cl. 355—77 **27 Claims**

1. The method of obtaining a target color on color photosensitive photographic media, utilizing an illuminant source and color filters, said method comprising:

(a) preparing a color reference data base relating a given illuminant source at a given Kelvin temperature and a given spectral distribution with various color filters and various undeveloped color photosensitive photographic media, and providing information as to which filters and respective filter exposure times are appropriate, when used with such an illuminant source and given photographic media, to substantially reproduce a given target color on the developed photographic media,

(b) determining the constituent primary color component makeup of the target color in relation to the illuminant source,

(c) from the target color component makeup, determining from the data base a group of color filters and the associated color filter exposure times appropriate to substantially reproduce the target color on a given photographic media when developed,


SELECT THREE COLORED FILTERS
FIND X, Y, Z OF TARGET COLOR
FIND X, Y, Z OF COMPLEMENT
DEVELOP POSITIVE MEDIA
DEVELOP NEGATIVE MEDIA

(d) exposing the undeveloped color sensitive photographic media to the illuminant source through each color filter for each respective filter exposure time thus determined, to substantially reproduce the target color on the photographic media when developed, and

(e) developing the exposed photographic media.

4,522,492

DISTANCE MEASURING DEVICE

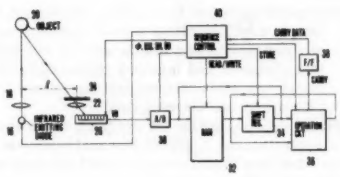
Makoto Masunaga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,320

Claims priority, application Japan, Jul. 10, 1981, 56-108718

Int. Cl.³ G01C *3/10*

U.S. Cl. 356—1 **5 Claims**



1. A device for detecting the range of an object, comprising:

(a) projecting means for projecting a beam of radiation toward the object,

(b) an accumulation type linear sensor array having a plurality of sensing elements each of which produces electrical data in response to received radiation;

(c) a shift register having the same number of registers as that of said sensing elements, said register being connected to said linear array to parallel transfer datum of said sensing elements;

(d) first memory means for memorizing the datum trans-

ferred to said shift register as it is serially read out from said shift register;

(e) second memory means for memorizing the datum transferred to said shift register as it is serially read out from said shift register;

(f) control means for controlling said shift register such that said first memory means is allowed to memorize that datum which occurs when said projecting means is not driven, and said second memory means is allowed to memorize that datum which occurs when said projecting means is driven;

(g) computing means for subtracting the datum memorized in said first memory means from the datum memorized in said second memory means; and

(h) means for detecting a maximum value of the computation values of said computing means and using said maximum value as a distance measuring information.

4,522,493

PARTIAL INJECTION APPARATUS

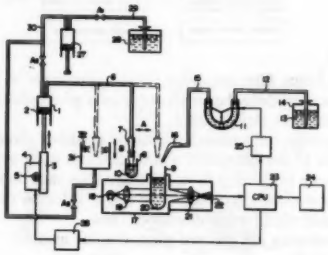
Akira Tamagawa, Hino, and Tokio Kano, Kunitachi, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Oct. 26, 1982, Ser. No. 436,662

Claims priority, application Japan, Nov. 19, 1981, 56-184371

Int. Cl.³ G01N *1/14, 33/48*

U.S. Cl. 356—36 **8 Claims**



1. A partial injection apparatus, comprising:

(A) sample injection means for injecting approximately a predetermined amount of sample into a container, said sample injection means including:

(1) a sample tube containing a sample to be diluted;

(2) a nozzle;

(3) a cleaning tank for applying a cleaning fluid to said nozzle when said nozzle is located in said cleaning tank; and

(4) operating means for moving said nozzle into said sample tube, aspirating a predetermined amount of said sample into said nozzle, moving said nozzle into said container and injecting substantially all of said sample into said container, and thereafter moving said nozzle into said cleaning tank;

(B) diluent injecting means for injecting, under the control of a control means, a diluent into said container so as to form a test fluid in said container, said test fluid including said sample and said diluent;

(C) detecting means for detecting the concentration of said test fluid; and

(D) said control means causing said diluent injecting means to:

(1) inject a first predetermined amount of diluent into said container, while amount is independent of the actual amount of fluid in said container, so that after said sample and said predetermined amount of diluent has been injected into said container the concentration of test fluid in said container will be at a level less than a desired level; and thereafter

(2) injecting an additional amount of diluent into said container as a function of said detected concentration so as to bring the concentration of said test fluid to said desired level.

4,522,494

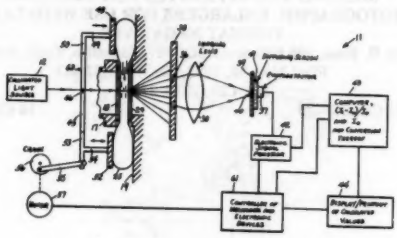
NON-INVASIVE OPTICAL ASSESSMENT OF PLATELET VIABILITY

Robert F. Bonner, Washington, D.C., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 7, 1982, Ser. No. 396,057

Int. Cl.³ G01N *33/48, 21/53*

U.S. Cl. 356—39 **17 Claims**



1. An apparatus for assessing the viability of platelets in a transparent flexible blood storage bag comprising a support, a collimated light source providing a beam defining an optical axis, means on said support for clampingly receiving a blood storage bag in a position substantially transverse to said axis such as to allow said beam to traverse the bag and to be scattered by platelets in the bag, means for aligning platelets within said bag substantially face-on with respect to said beam, light gate means in the path of scattered light and limiting transmission thereof to a predetermined scatter angle relative to said optical axis, photoelectric sensing means, means to direct the transmitted scattered light to said photoelectric sensing means, whereby to generate an electrical signal in accordance with the state of the platelets in the bag, and means to measure said signal.

4,522,495

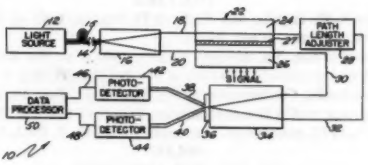
OPTICAL SENSING DEVICES

Peter Shajenko, Storrs, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1983, Ser. No. 503,913

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—345 **11 Claims**



1. An optical fiber sensing system, for very accurate measurement of the effects of a physical phenomena, comprising:

a light source means for producing a light beam;

a first multimode optical fiber, connected to said light source means, for receiving and transmitting said light beam;

beam splitting means, connected to said first fiber, for receiving said light beam and dividing said light beam into a signal light beam and a reference light beam, each of said

signal and reference beams being of equal phase and amplitude;

sensing means for receiving said signal beam and said reference beam from said beam splitting means, said sensing means being divided into a signal chamber and a reference chamber such that said signal beam and said reference beam experience all environmental effects equally, said signal chamber being further arranged so as to further expose only said signal beam to said physical effect to be measured thereby modulating said signal beam in proportion thereto;

path length adjusting means, for receiving said reference beam from the reference chamber of said sensing means and changing the pathlength of said reference light beam to equal the path length of said signal light beam, thus assuring temporal coherence therebetween;

beam recombining means for receiving said signal beam from the signal chamber of said sensing means and said reference beam from said path length adjusting means, said recombining means combining said signal beam and said reference beam in such a way as to form a fringe pattern having at least a center fringe and a fringe in quadrature relationship with the center fringe;

non-transparent plate means, fixedly attached to said recombining means for receiving center fringe and the fringe in quadrature relationship therewith and separating all the light energy of said center fringe from all the light energy of the fringe in quadrature relationship with said center fringe in such a way that 90° phase quadrature is maintained between said signal and reference light beams;

a zero order, multimode optical fiber, attached to said plate means, for receiving and transmitting therethrough said center fringe light energy from said plate means;

a first order, multimode optical fiber, attached to said plate means, for receiving and transmitting therethrough the fringe in quadrature relationship with said center fringe light energy from said plate means;

a first photodetector means, connected to said zero order fiber, for receiving said center fringe light energy and converting said light energy to a proportional zero order electrical signal;

a second photodetector means, connected to said first order fiber, for receiving the fringe in quadrature relationship with said center fringe light energy and converting said light energy to a proportional first order electrical signal; and

data processor means, connected to said first and said second photodetectors for receiving said zero order and said first order electrical signals, and processing said signals in such a way as to extract said physical effect measurement therefrom.

4,522,496

LASER GYRO MODE LOCKING REDUCTION SCHEME

Virgil E. Sanders, Newbury Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 068,244, Aug. 17, 1979, abandoned, which is a continuation of Ser. No. 909,919, May 26, 1978, abandoned. This application Mar. 23, 1981, Ser. No. 246,457

Int. Cl.³ G01C *19/64*

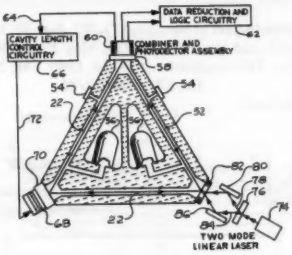
U.S. Cl. 356—350 **16 Claims**

1. A ring laser gyroscope comprising:

a ring laser body including reflective surfaces which define a closed loop optical path;

means including electrically charged gas plasma, gain medium means and means for controlling and tuning the length of said optical path for generating, amplifying, and maintaining at least two stronger counter propagating primary resonant traveling modes and for generating, amplifying and maintaining at least two weaker counter propagating secondary modes propagating in said optical path;

means for processing the frequency beat signal between said primary modes to generate signals representative of angular velocity of said ring laser body about its sensing axis; and


DATA REDUCTION AND LOGIC CIRCUITRY
CAVITY LENGTH CONTROL CIRCUITRY
COMBINER AND PHOTODETECTOR ASSEMBLY
TWO MODE LINEAR LASER

said means for controlling and tuning the length of said optical path being adjusted such that the amplitude of at least said two weaker counterpropagating secondary modes within said gain medium means to diminish lock-in between said primary modes.

4,522,497

WEB SCANNING APPARATUS

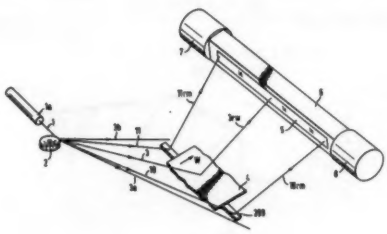
John B. Ikin, Leigh-on-Sea, England, assignor to Ciba Geigy AG, Basel, Switzerland

Filed Jun. 7, 1982, Ser. No. 385,593

Claims priority, application United Kingdom, Jun. 17, 1981, 8118575; Jun. 17, 1981, 8118576; Sep. 30, 1981, 8129538; Nov. 27, 1981, 8135928

Int. Cl.³ G01N *21/17*

U.S. Cl. 356—431 **32 Claims**



1. A method of photoelectrically scanning a moving web material which comprises scanning the web with a narrow light beam sweeping across and beyond the edges of the web, directing light reflected or transmitted by the web to a light receiver of a light measuring unit so generating a corresponding electrical signal, and optically simulating the optical reflexion or transmission property of the web for two auxiliary scanning zones adjacent the lateral edges of the web in such manner that the average strength of said electrical signal remains constant over substantially the whole scanning sweep.

4,522,498

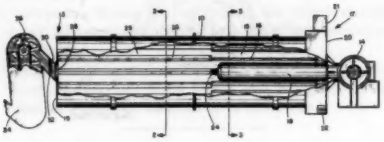
ASPHALTIC CONCRETE RECYCLE APPARATUS AND METHOD

Robert L. Mendehall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 871,351, Jan. 23, 1978, Pat. No. 4,208,131, and Ser. No. 906,734, May 17, 1978, Pat. No. 4,240,754. This application Apr. 14, 1980, Ser. No. 139,708

Int. Cl.³ B28C *5/46*

U.S. Cl. 366—4 **6 Claims**



1. An apparatus for treating asphalt-aggregate composition comprising:

an elongated rotatable drum having a first end and, as the only substantial opening thereat, a first port for introducing composition into said drum and closure means for closing said port except when composition is introduced, and a second end opposite said first end and and having a second port, open to atmosphere, for recovering composition and for venting substantially all hydrocarbon gases in the drum to atmosphere therethrough, and

a burner having a nozzle located in said drum intermediate said first and second ends for directing hot gases of combustion toward said first end, wherein said drum interior comprises a first section between said first end and said nozzle having first means for lifting composition as the drum is rotated to prevent a curtain of particles passing through the hot gases of combustion in said first section, and a second section between said nozzle and said second end having second means for lifting composition as the drum is rotated to form a curtain of particles passing through hot gases in said second section.

4,522,499

CONCRETE MIXER

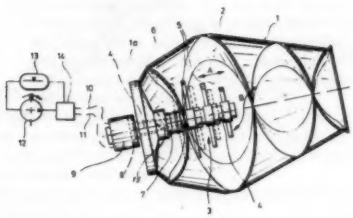
Gerhard Hudelmaier, Ulm, Fed. Rep. of Germany, assignor to Ingrid Hudelmaier, Ulm, Fed. Rep. of Germany

Filed Jul. 27, 1983, Ser. No. 517,763

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228983

Int. Cl.³ B01F *9/08*

U.S. Cl. 366—56 **3 Claims**



1. In combination with a concrete mixing drum having a side wall that tapers coaxially from a medial largest diameter portion to an upper end of the drum that is open for filling and discharge and to a bottom end of the drum that is closed by an end wall, said drum having an axis about which it is rotatable and normally having said axis inclined to the horizontal so that said upper end is higher than said bottom end, and agitating means fixed to said side wall in the interior of the drum and extending along a substantial portion of the length of the drum, for imparting mixing agitation to contents of the drum as it rotates:

A. A mixing tool for cooperation with said agitating means to effect thorough mixing of drum contents, comprising

(1) an elongated shaft which coaxially extends lengthwise slidably and relatively rotatably through said end wall and

(2) substantially radially projecting mixer elements secured to said shaft in the interior of the drum, in axially spaced relation to said end wall;

B. reciprocating actuating means at the exterior of the drum connected with said shaft for lengthwise reciprocating said mixing tool; and

C. cooperating means on said end wall and on said shaft for imparting rotation to said shaft in consequence of lengthwise movement thereof.

4,522,500

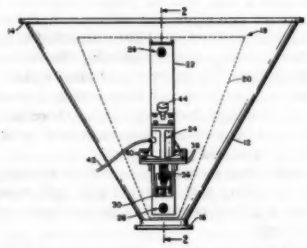
WALL-MOUNTED AGITATOR FOR PARTICULATE MATERIAL

Frank S. Hyer, Duxbury, Mass., assignor to Hyer Industries, Inc., Pembroke, Mass.

Filed Dec. 19, 1983, Ser. No. 563,285

Int. Cl.³ B01F *11/00*

U.S. Cl. 366—113 **12 Claims**



1. A particulate material agitator comprising, in combination,

an agitator panel formed to extend in generally parallel spaced relationship to and within a wall of a conveyor for said material,

an agitator frame external to said wall and having a powered vibrator thereon,

an elongate spacer extending through an aperture in said wall and rigidly securing the panel and frame together in spaced relationship, the agitator being adapted for vibrating the panel and frame predominantly in a direction parallel to said wall, and

a mount including annular flange means adapted for attachment to said wall about said aperture and an elastic annulus of sleeve-like form extending from the flange means in opposite directions along the extent of the spacer to ends of said annulus respectively terminating at opposing surfaces of the frame and panel, said annulus being compliant to movement of the frame and panel in directions both parallel and normal to said wall.

4,522,501

MONITORING MAGNETICALLY PERMEABLE PARTICLES IN ADMIXTURE WITH A FLUID CARRIER

Michael A. Shannon, Glenburnie, Canada, assignor to Northern Telecom Limited, Montreal, Canada

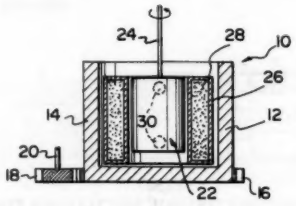
Filed Apr. 6, 1984, Ser. No. 597,377

Int. Cl.³ B01F *15/02;* **G05D** *11/13;* **G01N** *27/74;* **G01R** *33/12*

U.S. Cl. 366—142 **12 Claims**

1. A method of monitoring a quantity of magnetically permeable particles in admixture with a fluid carrier comprising

providing a magnetic field with flux lines having a direction or position change, placing the mixture within the magnetic field while interposing it between and out of physical contact with a source of the field and with a movable member also disposed within the field, the movable member having a degree of movement caused and influenced by the strength of the field; influencing the effect of the field upon the movable member by



the presence of the particles in the mixture to cause the member to move by a degree which corresponds to the strength of the field in the region of the member as affected by the quantity of particles in the mixture and affected by the field, and monitoring the degree of movement of the movable member, said movement also corresponding to the quantity of magnetically permeable particles in a unit quantity of the mixture.

4,522,502

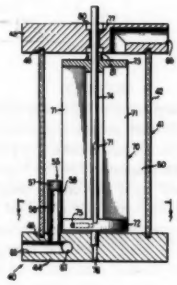
MIXING AND FEEDING APPARATUS

Carl L. Brazelton, Austin, Tex., assignor to Stran Corporation, Bradley, Ill.

Continuation-in-part of Ser. No. 436,023, Oct. 22, 1982, abandoned. This application Oct. 6, 1983, Ser. No. 539,552

Int. Cl.³ G05D *11/00*; **B01F** *15/02, 7/20*

U.S. Cl. 366—160 **39 Claims**



1. Mixing and feeding apparatus for receiving polymer and water and for activating and diluting the polymer, comprising a frame, a vessel mounted on said frame and defining a substantially cylindrical chamber therein, said chamber having a cylindrical axis and a given cross sectional area through the cylindrical axis, polymer inlet means for carrying the polymer to said chamber, means mounted on said frame for accurately adjusting the delivery rate of the polymer into said chamber, water inlet means for carrying the water to said chamber, means mounted on said frame for controlling the rate of water flow into said chamber, outlet means for carrying the activated and diluted polymer away from said vessel, an impeller mechanism mounted in said chamber for rotation about the cylindrical axis thereof for mixing the polymer and the water, said impeller mechanism including a plurality of fins having a combined surface area at least one-half the cross sectional area of the chamber, and means for rotating said impeller mechanism.

4,522,503

MIXING APPARATUS

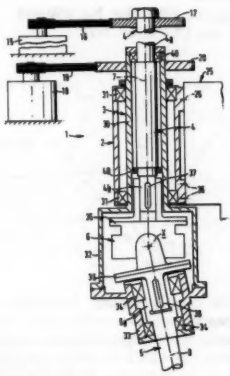
Keith Salter, Ailsworth, England, assignor to Baker Perkins Holdings PLC, England

Filed Aug. 2, 1984, Ser. No. 637,156

Claims priority, application United Kingdom, Aug. 10, 1983, 8321501

Int. Cl.³ B01F *7/00*

U.S. Cl. 366—287 **7 Claims**



1. Mixing apparatus, comprising:

a support member;

a shaft-support structure carried by and rotatable relative to the support member;

a drive shaft and a driven shaft each rotatably mounted on the shaft-support structure;

flexible coupling means connecting one end of the drive shaft with one end of the driven shaft, the shafts being disposed so that their axes of rotation are inclined to each other;

a mixer element carried by the other end of the driven shaft so as to rotate therewith;

means for rotating the drive shaft so that the driven shaft rotates the mixer element; and,

means for rotating the shaft-support structure about an axis common with the axis of rotation of the drive shaft.

4,522,504

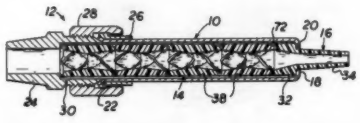
LINEAR IN-LINE MIXING SYSTEM

Peter H. Greverath, Berkley, Mich., assignor to Pyles Division, Wixom, Mich.

Filed Dec. 8, 1983, Ser. No. 559,254

Int. Cl.³ B01F *5/06*

U.S. Cl. 366—339 **6 Claims**



1. In-line mixing apparatus for mixing material flowing through a conduit, comprising, in combination, at least a pair of tubular elements each having a passage, a first end and a second end, orientation means defined upon said elements' first and second ends rotatably orientating engaging elements upon a pair of said elements being oriented in end-to-end abutting relationship with a first end engaging a second end, mixing means within said elements' passages agitating material flowing therethrough to intermix such material comprising helical

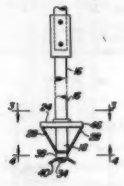
vanes within said elements' passages, said vanes within each element comprising first and second axially spaced vanes, the helix of said first vane being in the opposite direction of said second vane, said elements and vanes being homogeneously molded of a synthetic plastic material.

4,522,505

ROTOR FOR LIQUID MIXING DEVICE

Ronald A. Medd, Bettendorf, Iowa, assignor to C. R. Medd & Sons, Bettendorf, Iowa

Filed Sep. 17, 1984, Ser. No. 650,948
Int. Cl.³ B01F *7/18*
U.S. Cl. 366—343 **7 Claims**



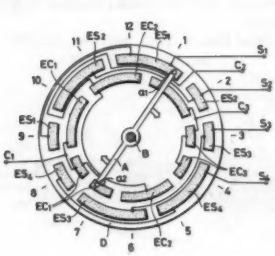
1. In a mixer of the class described, including an upright motor-driven shaft rotatable about a vertical axis and having a lower end portion, and a mixer rotor affixed to said lower end portion, the improvement in which the rotor comprises a blade element substantially in the form of a V having a flat bottom disposed diametrically across the lower end portion of the shaft, said blade element continuing in upward and outward divergent fashion from said flat bottom as blade arms symmetrical to the shaft at diametrically opposite sides thereof, each arm having an upper end and said ends lying in a common plane normal to the shaft axis, and a circular top member, concentric with the shaft and lying essentially in said plane, said member having a diameter on the order of the diametrical spacing between the upper ends of the arms and connected at its periphery to said upper ends and said periphery presenting a smooth annular surface.

4,522,506

TIME SIGNAL CLOCK

Yoshihito Owa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,822
Claims priority, application Japan, Sep. 21, 1983, 58-175028
Int. Cl.³ G04B *21/02*
U.S. Cl. 368—75 **1 Claim**



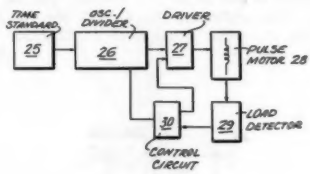
1. A time signal clock comprising: a base plate; two rows of plural electrodes disposed on said base plate; a contact member resiliently held selectively against two of the electrodes in the two rows for conducting the two electrodes; movable means for rotating one of said contact member and said base plate in unison with an hour hand to cause said contact member to slide relatively on said electrodes in the two rows; a pulse generator for supplying pulses which are successively out of phase with each other to the electrodes in one of the two rows; an output circuit responsive to outputs from the electrodes in the other row and said pulses for producing an output indicative of a display position of the hour hand; and time signal means for producing a time signal for an hourly time in response to the output from said output circuit.

4,522,507

STEP MOTOR CONTROL MECHANISM FOR ELECTRONIC TIMEPIECE

Yoshikazu Kawamura; Minoru Hosokawa; Sakiho Okazaki, and Hiroshi Ishii, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 133,046, Mar. 24, 1980, Pat. No. 4,370,065, which is a continuation of Ser. No. 839,867, Oct. 6, 1977, Pat. No. 4,212,156. This application Sep. 30, 1982, Ser. No. 430,292
Claims priority, application Japan, Oct. 6, 1976, 51-120146
The portion of the term of this patent subsequent to Jul. 15, 1997, has been disclaimed.
Int. Cl.³ G04F *5/00*; G04C *3/00*
U.S. Cl. 368—157 **4 Claims**

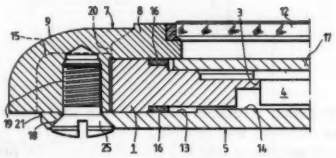


1. An electronic timepiece having a step motor and comprising a quartz crystal vibrator producing a high frequency time standard signal, divider circuit means for producing low frequency time signals in response to said high frequency time standard signal; a gear train driven by said step motor and adapted to place the step motor in one of a first normally loaded condition and a second loaded condition; load detection means for producing a load detection signal in response to detecting said second loaded condition of said step motor; driving and control means intermediate said divider circuit means and said step motor for receiving the low frequency signal from the dividing circuit means, said driving and control means being adapted to apply a first drive signal having a first pulse width to said step motor in response to said low frequency signal, said driving and control means in response to said load detection signal being applied thereto, being adapted to apply to said step motor a second drive signal having a pulse width of longer duration than said first pulse width, said step motor including a drive coil for receiving said first drive signal produced by said driving and control means, said load detecting means being adapted to detect the induced current in said drive coil in response to said first drive signal being applied thereto, said driving and control means including timer means, said timer means being adapted to select a predetermined time interval, said driving and control means being adapted to apply said pulse width of longer duration of said second drive signal to said drive coil during said predetermined time interval selected by said timer means.

4,522,508
WATCH CASE

Leonhard Meister, Selzach, Switzerland, assignor to Montres Universal S.A., Geneva, Switzerland

Filed Aug. 14, 1984, Ser. No. 640,606
Claims priority, application Switzerland, Aug. 22, 1983, 4566/83
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—276 8 Claims



1. A watchcase of the type having an annular main part constituting a caseband and two auxiliary parts constituting a bezel and a back, wherein the improvement comprises:

a number of indentations distributed along the periphery of said caseband and

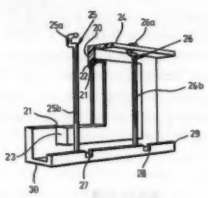
a like number of pillars integral with one of said auxiliary parts,

said pillars being fitted into said indentations, and the other one of said auxiliary parts being fixed against said pillars.

4,522,509
CLOCKWORK RETAINING ASSEMBLY

Karl W. Schmidt, Idar-Oberstein, Fed. Rep. of Germany, assignor to Gebrüder Schmidt GMBH & Co. KG, Idar-Oberstein, Fed. Rep. of Germany

Filed Jun. 22, 1983, Ser. No. 506,712
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244918
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—300 10 Claims

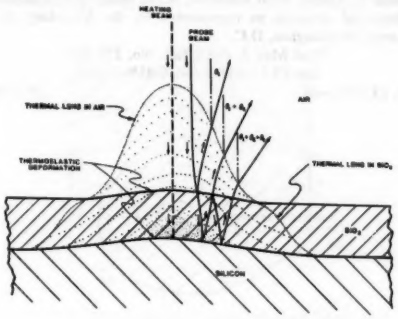


1. A clock having a clockwork carrier formed with an opening, a seat adjacent said opening and a pair of opposite walls flanking said opening, a clockwork received in said opening and braced against said seat, and a pair of generally parallel transversely spaced retaining spring rods having respective opposite ends engaged in said walls and spanned across a back of said clockwork and resiliently braced against said clockwork at least in part by a bend in at least one end of each rod.

4,522,510
THIN FILM THICKNESS MEASUREMENT WITH THERMAL WAVES

Allan Rosencwaig, Danville, and Jon Opsal, Livermore, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 401,511, Jul. 26, 1982,. This application Apr. 1, 1983, Ser. No. 481,275
Int. Cl.³ G01N *21/41, 25/72*
U.S. Cl. 374—7 20 Claims



1. A method for evaluating microscopic thermal features in a sample comprising:

focusing an intensity modulated heating beam of energy at a microscopic spot on the surface of the sample to produce periodic thermal waves;

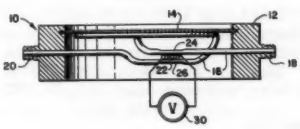
focusing a probe beam of energy on a portion of the surface of the sample which is being periodically heated by the thermal waves, with said probe beam being substantially parallel to and laterally spaced from the heating beam; and

monitoring the periodic angular displacement of the reflected probe beam, said periodic displacement resulting from the periodic angular changes in the surface conditions of the sample induced by the periodic thermal waves whereby the periodic angular displacement of the reflected probe beam can be used to evaluate microscopic thermal features in a sample.

4,522,511
METHOD AND APPARATUS FOR MEASURING RADIANT ENERGY

Robert W. Zimmerer, Port Angeles, Wash., assignor to Scientech, Inc., Boulder, Colo.

Filed Sep. 13, 1982, Ser. No. 417,283
Int. Cl.³ G01J *5/12;* G01K *17/20*
U.S. Cl. 374—32 4 Claims



1. In a fluid cooled radiant energy measuring device having an absorber structure for receiving and absorbing the radiant energy, and a coolant system including a coolant conduit having inlet and outlet legs and adapted to flow a coolant therethrough to carry away the absorbed energy, the improvement comprising:

the coolant conduit and the absorber structure being in thermal contact; and

a plurality of Peltier effect junctions with opposite sides of the junctions in thermal contact with the inlet leg and the

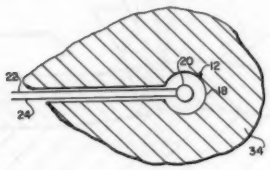
outlet leg respectively of the coolant conduit, whereby the absorber structure will be effectively cooled by thermal contact with the coolant conduit, and the radiant energy measured by the Peltier effect device to determine the radiant energy falling on the absorber structure.

4,522,512

THERMAL CONDUCTIVITY MEASUREMENT METHOD

Ronald T. Atkins, West Lebanon, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1982, Ser. No. 375,066
Int. Cl.³ G01F *1/68;* G01N *25/18*
U.S. Cl. 374—44 **16 Claims**



1. A method for measuring bulk thermal conductivity (K_m) of a material comprising the steps of:

a. embedding a small combined sensor and heat source having a heat bead surrounded by an envelope in a substantially large material;

b. determining the temperature value of said material using said combined sensor and heat source;

c. determining the thermal energy value (Q in calories per second) generated by said heat bead;

d. determining the surface temperature value of said heat source envelope;

e. determining the radius value of said heat source envelope; and

f. calculating said thermal conductivity (K_m) by utilizing said determined values in the equation

$$K_m = \frac{Q}{4\pi(T_1 - T_2)r_1}$$

where:

Q equals the thermal energy in calories per second generated by said heat source and sensor

T_1 equals the surface temperature of said heat source envelope

T_2 equals the temperature of said material

r_1 equals the radius of said heat source envelope.

4,522,513

TAPERED-LAND THRUST BEARING DEVICE

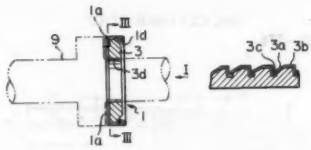
Shigehiro Nozue, Toyota, and Tatsuhiko Fukuoka, Aichi, both of Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Filed Mar. 28, 1983, Ser. No. 479,313
Claims priority, application Japan, Mar. 27, 1982, 57-48112
Int. Cl.³ F16C *17/04*
U.S. Cl. 384—368 **6 Claims**

1. A tapered-land thrust bearing device adapted to be disposed between two members rotating relatively to each other and to bear a thrust force exerted by said relative rotation members, said thrust bearing device comprising:

a disk-shaped bearing member adapted to be engaged with one of said relative rotation members and having a tapered-land face on at least one side, said tapered-land face comprising tapered surfaces and flat-land surfaces successively formed along the peripheral direction thereof; and

a race member comprising a radially extending wall having a face which is adapted to be engaged with the other relative rotation member and an opposite-side face arranged to contact said tapered-land face of said disk-shaped bearing member by the thrust face to define a sliding surface therebetween, a peripheral wall axially extending from the periphery of said radially extending



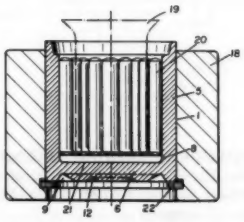
wall to define a retainer for receiving said disk-shaped bearing member, and retaining means integrally formed with said peripheral wall at a free end thereof for preventing said disk-shaped bearing member from falling away from said race member.

4,522,514

THIN-WALLED BEARING BUSHING PRODUCED BY DEEP DRAWING

Armin Olschewski, Schweinfurt; Hermann Hetterich, Heidenfeld; Peter Horling, Mainberg, and Berthold Beyfuss, Kaisten, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 13, 1983, Ser. No. 484,573
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215718
Int. Cl.³ F16C *33/58*
U.S. Cl. 384—569 **17 Claims**



1. In a thin-walled deep-drawn bearing bushing for the seating of pins in universal joints, including a cylindrical sleeve section and a bottom section closing the sleeve section at an end thereof, the bottom section having an outer surface wherein at least one axially pressed recess is formed near the periphery of the outer surface forming a relatively sharp peripheral edge, the improvement comprising the outer surface of the bottom section being formed with at least one recess radially displaced inwardly relative to the nearly peripheral recess, thereby reducing the wall thickness of the bottom section of the bearing bushing.

4,522,515

MOUNTING DEVICE FOR ANTIFRICTION BEARING

Toshio Miki, Higashi-yamamoto-shinmachi; Yoshihide Toda, and Kenichi Horii, both of Aichi, all of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

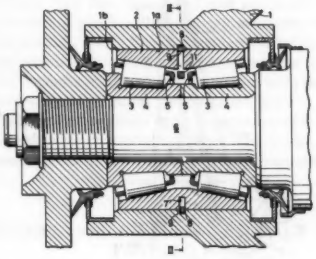
Filed Sep. 27, 1983, Ser. No. 536,442
Int. Cl.³ F16C *35/077*
U.S. Cl. 384—571 **7 Claims**

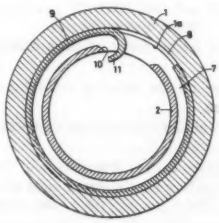
1. A bearing mounting device comprising;

a first circumferential groove provided in the outer peripheral

face off the raceway of the outer race of an antifriction bearing,

a second circumferential groove provided in the inner periphery of said bore where said bearing is mounted and opposed to said first circumferential groove in the outer periphery of the outer race thereof,





an opening provided in part of the bottom of said first circumferential groove and communicating with the interior of said outer race,

an elastic fixing means inserted peripherally into said first and said second circumferential grooves astriding both, and

an end portion of said fixing means revealed inside said outer race through said opening in said first circumferential groove.

4,522,516

ROLLER BEARING SUPPORT STRUCTURE WITH METAL WINDOW CAGE

Gerhard Neese, Schonungen, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 312,818, Oct. 19, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,230

Claims priority, application European Pat. Off., Nov. 3, 1980, 80106739.8

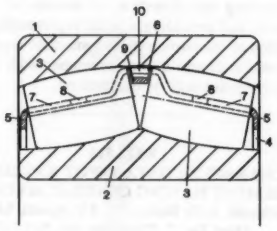
Int. Cl.³ F16C *33/48*

U.S. Cl. 384—572 **4 Claims**

1. A metal window cage for the bearing rollers in a double row shoulderless, spherical roller bearing, wherein

the bearing includes two annular rows of rollers having axially inwardly facing surfaces which are nearly in contact, an inner ring with a respective radially outwardly facing inner raceway for each of the rows of rollers, and an outer ring with a radially inwardly facing outer raceway facing toward and radially spaced from the inner raceway; the rollers being in rolling contact with the outer and the respective raceways;

the cage being comprised of an elastically deformable hardened metal; the cage comprising an inboard cage ring disposed between the axially inwardly facing surfaces of the rows of rollers; the inboard cage ring extending around the outer raceway and being positioned to run parallel to the outer raceway; the inboard cage ring having an outwardly facing external surface which is positioned nearly in contact with the outer ring raceway; the external surface of the inboard cage ring being generally scalloped to define a series of depressions extending around the inboard cage ring at spaced intervals, with each depression being at a respective pair of the rollers located at opposite sides of the inboard cage ring, and each depression extending across the whole axial width of the inboard cage ring;



the cage further comprising two outboard cage rings, each axially outboard of one of the two rows of rollers, and the outboard cage rings extending radially inwardly toward the inner ring;

the cage further comprising cross pieces which connect the inboard and outboard cage rings; cross pieces being disposed circumferentially around the cage at intervals for spacing rollers apart around the cage.

4,522,517

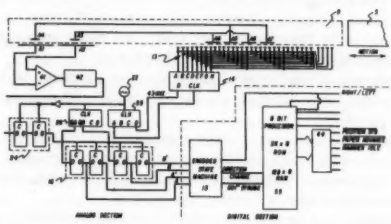
ENCODER SYSTEM FOR DOT MATRIX LINE PRINTER

Kenneth B. Wade, 804 N. 3rd St., Battle Ground, Wash. 98604, and Phillip R. Luque, 4172 Creswell Way, Boise, Id. 83704

Filed Nov. 10, 1983, Ser. No. 551,662

Int. Cl.³ B41J *19/30*

U.S. Cl. 400—322 **15 Claims**



1. Apparatus for determining the position, with respect to a reference point, of a movable member comprising:

means for producing a train of successive polyphase pulses and a train of successive reference pulses;

transmitting means for transmitting said polyphase pulse train;

receiving means capacitively coupled to said transmitting means for producing a signal from a summation of successive coupled pulses of said polyphase pulse train, said signal embodying information indicative of the position of said movable member with respect to said reference point;

detector means coupled to said receiving means providing a TTL signal, derived from said signal, representing the phase of said signal;

first means coupled to said detector means for comparing said TTL signal with said reference pulse train to provide a first signal representing a first incremental position change of said movable member and a second signal repre-

senting a second incremental position change of said movable member; and

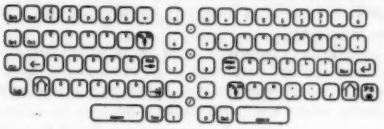
second means coupled to said first means for comparing said first incremental position with said second incremental position change and providing an output strobe representing an incremental position change of said movable member when said position changes are occurring in the direction of motion of said movable member and said first position change being one increment away from said second position change, and providing an output signal representing the direction of motion of said movable member, and providing a pulse representing a change of direction of the motion of said movable member whereby the position of said movable member with respect to said reference point may be determined.

4,522,518

CHARACTER DATA INPUT KEYBOARD ARRANGEMENT HAVING CENTRAL MATRIX OF KEYS

John R. Schmidt, 3239 Bishop St., Cincinnati, Ohio 45220

Filed Jul. 7, 1983, Ser. No. 511,741
Int. Cl.³ B41J *5/10*
U.S. Cl. 400—486 **35 Claims**



1. A two-handed, manually actuable, character data input keyboard arrangement having a plurality of letter and accessory keys,

wherein each of said letter keys represents one letter of an alphabet, the complete set of said letter keys arranged to comprise two substantially regular arrays of complementary subsets of said set, said two arrays including all of the letters of said alphabet and other keys, said other keys comprising accessory keys,

each of said arrays having three substantially straight substantially horizontal rows, said rows being substantially evenly spaced and substantially parallel,

and each of said arrays having also five columns, said columns being substantially evenly spaced and substantially parallel;

each of said arrays primarily augmented by at least one row of one or more accessory keys, said last-mentioned row substantially parallel to, and adjacently beneath, the bottommost row of the respective array,

each of said primarily-augmented arrays secondarily augmented by one or more columns of keys, located lateral and adjacent to the lateralmost column of the respective primarily augmented array,

each of said secondarily-augmented arrays thirdly augmented by at least one row of accessory keys, said last-mentioned row substantially parallel to, and adjacently above, the topmost row of the respective secondarily-augmented array,

and each of said thirdly augmented arrays, defining clusters, spaced horizontally apart from each other and separated by a matrix of keys comprising at least one column of keys including at least four keys therein,

wherein the bottommost row of said matrix is readily accessible by the thumbs from their home positions on the bottommost row of said primarily-augmented arrays,

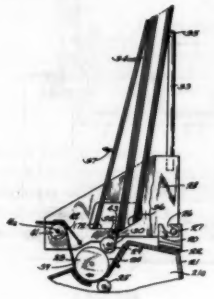
and such that the remaining rows of keys in said matrix are readily accessible by the index fingers from their home positions in the middle rows of said arrays.

4,522,519

APPARATUS AND PROCESS FOR DROP-FEEDING SHEETS TO A TYPING OR PRINTING MACHINE INCLUDING SEPARABLE PAPER CLAMPING TRAYS

R. Clark DuBois, 332 Wakeman Rd., Fairfield, Conn. 06430

Filed Nov. 29, 1982, Ser. No. 445,262
Int. Cl.³ B41J *13/10*
U.S. Cl. 400—624 **13 Claims**



1. In a drop-sheet feeder for a printing machine having a platen,

a frame supported by the printing machine and disposed above the platen,

a plurality of trays at all times supported generally vertically on said frame,

a first support surface for the lower ends of the trays,

a second support surface for the lower ends of the trays, and

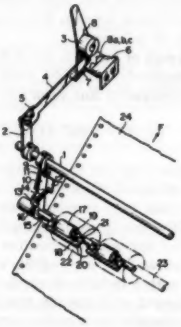
a tray shifter means for moving the lower ends of the trays from the first support surface to the second support surface.

4,522,520

DEVICE FOR ADJUSTING PRINTING PAPER TENSION IN A PRINTER

Hideaki Takenoya, and Fumiyuki Mishima, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Japan

Filed Jun. 7, 1984, Ser. No. 618,213
Claims priority, application Japan, Jun. 17, 1983, 58-92114
Int. Cl.³ B41J *13/02*
U.S. Cl. 400—636.1 **3 Claims**



1. A device for adjusting printing paper tension in a printer, comprising:

a switching member rotatably mountable to a machine frame of the printer;

a connecting structure connected with said switching mem-

ber and including a pressure plate with a supporting arm, one end of said supporting arm being pivotably mounted to said pressure plate, said supporting arm also being connected to the pressure plate by a tension spring;

a roller shaft connected to another end of the supporting arm;

a plurality of pinch rollers rotatably connected to said roller shaft, one end of each of said pinch rollers having a stepped portion, said stepped portion having a diameter smaller than the diameter of said pinch roller; and

a plurality of pinch roller pressing members secured to the roller shaft, each of said pressing member having a pressing part comprising a spring member that is weaker than the tension spring and makes contact with the small diameter stepped portions of the pinch rollers, whereby the pinch rollers separate from, or contact lightly or strongly a feed roller of a printing paper feed device via said connecting structure by rotation of said switching member.

4,522,521

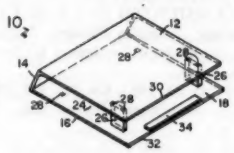
PRINTER STAND INCLUDING STORAGE AREA FOR FANFOLD PAPER

Douglas Scott, 7081 Great Oaks Rd., Germantown, Tenn. 38138

Filed Aug. 11, 1983, Ser. No. 521,998

Int. Cl.³ B41J *29/02*

U.S. Cl. 400—691 **14 Claims**



1. A printer stand for supporting a printer apparatus and providing a storage area for fanfold paper used by the printer apparatus, which printer stand comprises:

(a) an integral frame element having a general U shape, said frame element having a top sheet element with a back edge and an upper surface on which said printer apparatus is placed, a front sheet element and a bottom sheet element having an upper surface and a back edge, and characterized by an open back end, to define a storage area between said sheet elements for the storage of a stack of fanfold paper used in the printer apparatus placed on the upper surface of the top sheet element, the back edge of the bottom sheet element extending outwardly a defined distance greater than the back edge of the top sheet element, to provide for the free, upward, generally vertical movement of said fanfold paper from the storage area to said printer apparatus;

(b) a paper-restraining means secured to the upper surface of the bottom sheet element and extending across at least a portion of the open back end and positioned generally below the back edge of the top sheet element and having sufficient height to retain said fanfold paper within the storage area, while the paper from the top of said fanfold stack is pulled upwardly in use by said printer apparatus; and

(c) at least two support post means within the storage area and toward the open back end, to support the top sheet element, when the printer apparatus is placed on the upper surface of the top sheet element, said post means being secured to one of said top or bottom sheet element, said post means being spaced slightly apart from an opposite floating surface of the sheet element to which the post means is not secured, when the printer stand is not in use, said post means providing support to the top sheet element when said printer apparatus is placed on said upper surface of said top sheet element.

4,522,522

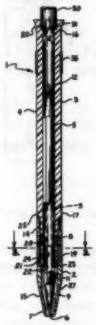
PENCIL HOLDER

Arthur R. Zeitelhack, 8711 Stark, Kansas City, Mo. 64138

Filed Aug. 6, 1982, Ser. No. 406,002

Int. Cl.³ B43K *23/00*

U.S. Cl. 401—88 **2 Claims**



1. A pencil holder for retaining a wooden pencil and comprising:

(a) first and second holder members coaxially aligned having a through bore, and forming a holder body, said body and said bore being sized to receive a wooden pencil;

(b) said firs t holder member being approximately one third of a length of said body, and having a lower open ended tip formed by a converging conical neck with an aperture so that a conical pencil tip may extend partially therethrough and the remainder firmly abutting against said neck surrounding said aperture; said first holder member haivng an upper end portion with interior threads and an interior annular wall constriction angling sharply toward said bore and positioned between said interior threads and said neck; and

(c) said second holder member having a lower end forming a chuck having external threads and split leaves with a sloping end wall on said leaves selectively engagable with said interior annular wall constriction;

(d) whereby when said first holder member is screwed toward said second holder member said leaves advance and encounter said interior annular wall constriction and flex inwardly into said through bore to firmly engage said leaves end wall with a pencil outer surface received therein for maintaing said pencil in retracted position within said bore and in an extended position, in combination with said converging conical neck, firmly supporting and maintaining said pencil in said extended position in a two position grip.

4,522,523

ENAMEL TOUCH-UP KIT INCLUDING KNIFE BLADE

Kurt Vogelsang, Forch, Switzerland, assignor to Kurt Vogelsang GmbH, Hassmersheim, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 512,981

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226219

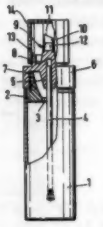
Int. Cl.³ A64B *11/04;* **B65D** *51/24*

U.S. Cl. 401—126 **12 Claims**

1. Paint touch-up kit for repairing paint on automobiles and the like, comprising:

a touch-up paint container;

a screw cap for selectively closing and opening the container;
a touch-up brush;
a base of the brush being attached to the screw cap;
a removable lid covering a hollow space of the screw cap and engageable with a collar of said screw cap;
a rust-removing knife blade accommodated in the hollow

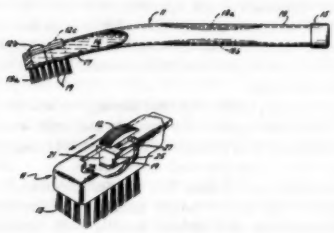


space, which tool is accessible and usable upon removal of the lid;
wherein said knife blade is mounted to a peg-like extension of the screw cap with its base extending in opposition to the brush away from the screw cap; and
wherein the lid is fashioned as a protective cap forming the hollow space, said lid being detachably attached to the screw cap and enclosing the tool on all sides.

4,522,524
DISPOSABLE TOOTHBRUSH WITH INTEGRAL DENTIFRICE

Arlene Green, 1427 Thornberry Rd., Wyncote, Pa. 19095

Filed Jul. 29, 1983, Ser. No. 518,430
Int. Cl.³ A45D *44/18*; B43M *11/06*
U.S. Cl. 401—183 2 Claims

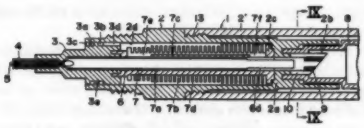


1. A disposable dentifrice dispenser and toothbrush comprising:
(a) a generally cylindrical handle portion forming a dentifrice storage chamber;
(b) a hollow head portion of generally rectangular cross-sectional shape formed integral with said handle portion, said head portion having opposed parallel upper and lower walls;
(c) toothbrushing bristles extending outwardly from the lower wall of the head portion;
(d) an unrestricted internal passage joining the dentifrice storage chamber with the interior of the head portion, permitting unrestricted flow of dentifrice therethrough;
(e) a longitudinally disposed slot formed in the upper wall of the head portion;
(f) means defining a dispensing opening in the lower wall of the head portion for passage of the dentifrice;
(g) a valve member slidably retained within the head portion movable between forward and rearward positions, said valve member having an elongated upper flange portion thereof engaging the inner side of the upper wall of said head portion said valve member having a lower portion of lesser longitudinal and transverse extent than the upper portion engaging the inner surface of the lower wall of the head portion, thereby providing a bypass means around said valve member when in the rearward position; said valve member in the forward position thereof exposing said dispensing opening to permit passage of dentifrice therethrough and in the rearward position thereof engaging over and closing said dispensing opening;
(h) a tab fixedly secured to said movable valve member projecting upwardly through said slot to permit movement of said valve member between said forward and rearward positions;
(i) and the handle portion being fabricated from a manually deformable material which will admit of repeated deformations and recoveries upon being manually squeezed and released, whereby squeezing of the handle portion when said valve member is in its forward position will force dentifrice through the dispensing opening onto said bristles whereas inadvertent squeezing of said handle will not result in movement of said valve member from said rearward to said forward position.

4,522,525
WRITING INSTRUMENT HAVING A NEEDLE SLIDABLY MOUNTED IN A TUBULAR TIP

Sigeru Saito, Kasuga; Takahiko Shimizu, Tokyo, and Takasi Tamura, Soka, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,226
Claims priority, application Japan, Aug. 3, 1982, 57-118219[U]
Int. Cl.³ B43K *1/06, 5/16, 1/10*
U.S. Cl. 401—258 11 Claims

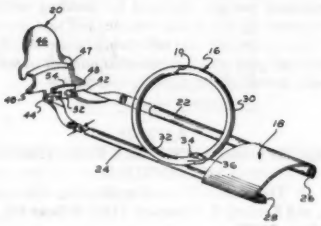


1. In a writing instrument comprising a cylindrical casing having therein an ink reservoir, a tubular writing tip, a cylindrical holder for holding said tip, ink feed means disposed between said cylindrical holder and said ink reservoir for feeding ink in said ink reservoir towards said tip, a needle longitudinally slidably positioned within said tip and normally projecting outwardly from one end of said tip and operable to be depressed when writing force is applied to said tip to forcibly retract said needle within said tip, and a weight element connected to said needle for facilitating the longitudinal movement of said needle within said tip, the improvement comprising:
projection means for limiting the displacement of the weight element rearwardly towards said ink reservoir, said projection means comprising at least one projection formed on and extending inwardly from an inner surface of said casing at a position to be abutted by said weight element, said projection extending longitudinally axially of said casing; and
channel means for feeding ink in said reservoir towards said ink feed means even when said weight element is in abutment with said projection means, said channel means including at least one slit in said casing adjacent said projection means.

4,522,526
RING MECHANISM FOR LOOSE LEAF BINDERS AND METHOD OF MANUFACTURE THEREFOR

Arthur Lozfau, Belchertown, and William H. Lucey, Holyoke, both of Mass., assignors to Dennison National Company, Holyoke, Mass.

Filed Jun. 28, 1982, Ser. No. 392,559
Int. Cl.³ B42F 13/00, 13/22, 3/04, 13/36
U.S. Cl. 402—37 5 Claims

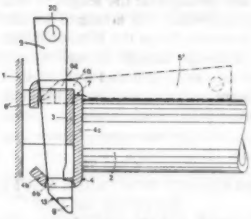


1. Ring mechanism for looseleaf ring binders comprising an arcuate spring metal cover plate having inturned, opposing edge channels, a pair of parallel, spaced metallic rails, oval in cross-section, rotatably disposed within the channels and each having a plurality of mating ring segments affixed on said rails at corresponding spaced locations and forming the rings of said binder, the outer ends of said rails including angularly offset crank arm portions, each having laterally and axially extending tang portion having opposed, generally planar surfaces at its outer end and a pivotable operating lever disposed at each end of the cover plate, said lever having spaced opposed portions coupled with the planar surfaces of said tangs to rotate said rails selectively in opposite directions and thereby carry said ring segments toward and away from each other both to open and close said rings, using said operating lever.

4,522,527
TUBULAR-TYPE SCAFFOLDINGS, METHOD FOR ASSEMBLING THEM AND TO THE HORIZONTAL TRANSOMS INCORPORATED THEREIN

Cyril M. Grandpierre, La Ciotat, France, assignor to Entrepose Travaux Publics, Paris, France

Filed Sep. 14, 1982, Ser. No. 418,191
Claims priority, application France, Sep. 24, 1981, 81 18182
Int. Cl.³ E04G 7/00
U.S. Cl. 403—49 12 Claims

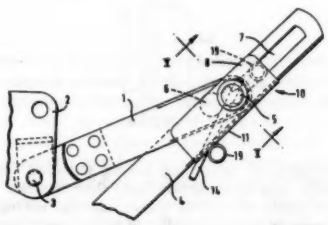


2. Scaffolding of a tubular type composed of vertical elements, hollow sockets fixed thereon and of horizontal transoms comprising, at least one end of the horizontal transoms, a fork engaged with one of said sockets, comprising a vertical wall which is fixed to said at least one end and two horizontal flanges, the upper horizontal flange comprising an upper slot and the lower horizontal flange comprising a lower slot, said fork bearing a conical pin which is engaged through the slot in said upper flange when in a substantially horizontal rest position, wherein said pin comprises a pivot constituted by at least one projection located on a lateral face of said pin near the narrow end thereof and which abuts against the lower face of said upper horizontal flange, and wherein said pin further comprises means for positioning the pin at rest in a substantially horizontal position so that when said vertical wall of the fork abuts against said socket, the upper edge of said socket comes in abutment against the lower edge of said pin, slightly to the rear of said pivot and causes the pin to pivot to the vertical, to descend by gravity inside said socket and to engage in the slot in the lower flange.

4,522,528
TILT CAB SUPPORT STAY

Ronald Bewers, Maldon, England, assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 283,578, Jul. 15, 1981, Pat. No. 4,438,826.
This application May 18, 1983, Ser. No. 495,900
Claims priority, application United Kingdom, Jul. 30, 1980, 8024966
Int. Cl.³ F16C 11/10
U.S. Cl. 403—61 9 Claims



1. A stay having a collapsed position, a first supporting position in which the stay has a second and longer length, the stay comprising first and second arms, a pin, and a channel member having two spaced apart side walls connected by an end wall or web, the two arms having first end regions proximate a first end of each arm to be connected to respective members between which the stay is to extend, and second end regions proximate a second end of each arm formed with longitudinally extending slots, the slotted end regions of the arms overlapping one another and being disposed between the side walls of the channel member, the pin extending between the side walls of the channel member and passing through the slots to thus connect the arms together, the pin being rotatably mounted and having a first axial portion which lies in the slot in the first arm, and a second axial portion which lies in the slot to the second arm, both axial pin portions being of non-circular cross-section, each slot having a wider portion in which the respective axial pin portion is freely rotatable, and a narrower portion comprising surfaces engageable with the axial pin portion through which the respective axial pin portion is not freely rotatable and which narrower portion the respective axial pin portion can enter only when correctly aligned therewith, the wider portion of each slot being at the end thereof remote from the second end of the respective arm, the arrangement being such that in the collapsed position of the stay the pin is carried in the narrower slot portion of the first arm and in the wider slot portion of the second arm, during movement of the stay to the first supporting position of the stay both arms are moved rotatively with respect to the pin and the first arm is moved in translation to permit passage of the first axial pin portion into the wider slot portion of the first arm and the pin is therefore carried in the wider slot portion of both arms, and rotative movement of the second arm with respect to the pin and translational movement of the second arm effects positioning of the second pin axial portion in the narrower slot portion of the second arm such that the pin is carried in a wider slot portion of the first arm and in a narrower slot portion of the second arm.

4,522,529

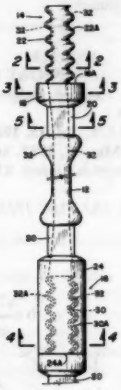
PRE-STRESSED FIBER-RESIN SUCKER ROD AND METHOD OF MAKING SAME

Edwin E. Conley, P. O. Box 14090, Tulsa, Okla. 74104

Continuation-in-part of Ser. No. 320,463, Nov. 12, 1981,. This application Nov. 26, 1982, Ser. No. 444,684

Int. Cl.³ E21B *17/00*

U.S. Cl. 403—343 **3 Claims**



1. An elongated sucker rod having threaded ends and a substantially solid cross-section body therebetween, said rod comprised solely of curable plastic material having formed therein, prior to cure, a plurality of longitudinal fiber strands which have been pre-stressed and, said fiber strands in said solid body portion all lying substantially parallel to the longitudinal axis of said sucker rod, while the portions of said fibers adjacent said threaded ends follow the peaks and valleys of said threads in a longitudinal direction.

4,522,530

SELF-ERECTING ROADWAY MARKING POST

W. Eugene Arthur, 1930 Winton Ave., Bldg. 11, Hayward, Calif. 94545

Filed Dec. 9, 1982, Ser. No. 448,298

Int. Cl.³ E01F *9/01*

U.S. Cl. 404—10 **9 Claims**

1. A self-erecting post adapted for marking a roadway, comprising an elongated flexible and collapsible tube of resilient plastics material and having an annular cross-sectional configuration, said tube having a lower portion adapted to project downwardly into a hole within the ground and an upper portion projecting substantially above the ground, said upper portion of said tube being capable of bending above the ground through an angle of ninety degrees in response to being accidentally impacted by a motor vehicle, a set of spring-like tube retaining members, said lower end portion of said tube having a hole for each said retaining member, said retaining members having lower end portions rigidly secured to the inner surface of said tube and projecting upwardly and outwardly through the corresponding said holes, said retaining members having upper end portions being engagable with the ground in response to inserting said lower portion of said tube into a hole within the ground, an elongated tubular erecting member of resilient flexible material, said erecting member extending within said upper portion of said tube and within said lower portion of said tube between said lower end portions of said retaining members, said erecting member having an intermediate portion disposed for bending with said tube when impacted by the motor vehicle, and said erecting member and the surrounding said tube being cooperatively effective to provide said post with a substantial number of self-erections in response to vehicle impacts on said post.

4,522,531

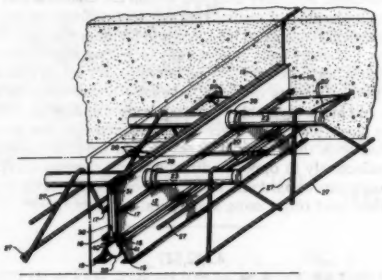
TRANSVERSE JOINT CELL FOR CONCRETE STRUCTURES

Bernard D. Thomsen, 117 S. Mayfair Dr., Mankato, Minn. 56001, and Kenneth L. Thomsen, 11623 Palmer Rd., Minneapolis, Minn. 55437

Filed May 18, 1983, Ser. No. 495,776

Int. Cl.³ E01C *11/02;* E01F *5/00*

U.S. Cl. 404—2 **22 Claims**



19. A transverse joint cell comprising:

a water-impermeable liner means disposed between adjacent transverse joint edges of concrete pavement, said liner means defining an open cell therebetween;

support means for supporting said liner means;

compressible block means for absorbing compression due to expansion of adjacent concrete panels, and disposed between and throughout the length of said liner means and being constructed and arranged to allow fluids to pass freely downwardly in the joint cell; and

seamless drainage trough means extending transversely through said open cell and in fluid tight relation to said liner means and being constructed and arranged below said compression block means.

4,522,532

BOTTOM-SEATED PORTABLE COFFERDAM AND METHOD OF USE

Ronald M. Fedrick, 416 Clearview Pl., Petaluma, Calif. 94952

Filed Jul. 25, 1983, Ser. No. 516,741

Int. Cl.³ E02D *19/04*

U.S. Cl. 405—11 **27 Claims**

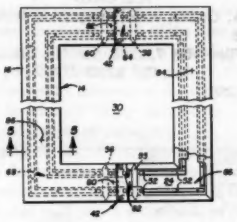
1. A bottom-seated portable cofferdam for providing working access to underwater surfaces which are generally horizontal, comprising

a housing having a bottom opening for permitting access to the underwater surfaces,

skirt means extending generally horizontally about the periphery of the housing, and

first and second seal means each arranged about the periph-

ery of the housing and operatively secured to the skirt means in spaced-apart relation to each other for forming together a differential, pressure chamber open along its



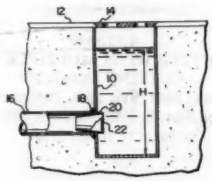
bottom and extending about the periphery of the housing, the first and second seal means being generally flexible for mating with the underwater surfaces.

4,522,533

FLOW RESTRICTOR

R. Clark Campbell, Orangeville, and D. Ronald Townsend, Gloucester, both of Canada, assignors to The Corporation of the Town of Vaughan, Ontario and The University of Ottawa, Ottawa, both of, Canada

Filed Jun. 22, 1983, Ser. No. 506,848
Claims priority, application Canada, Jun. 24, 1982, 405883
Int. Cl.³ E03F *3/04, 5/00*
U.S. Cl. 405—36 **14 Claims**



1. A flow restrictor for insertion in the inlet of a substantially horizontally oriented outlet pipe of a catch basin to restrict fluid flow within said pipe to a predetermined maximum, said restrictor being comprised of:

a tapered tubular hollow body portion having a smaller diameter end and a larger diameter end;

a cover plate attached to said larger diameter end;

an aperture having a predetermined cross-sectional area located in said cover plate, said smaller diameter end being open to fluid flow, wherein said predetermined cross-sectional area determines said predetermined maximum fluid flow;

a sleeve member, said tapered tubular hollow body being wedged within said sleeve member, said sleeve member being adapted for insertion into the inlet of said outlet pipe;

wherein said tapered tubular hollow body can be frictionally held within said outlet pipe so that said flow restrictor partly extends from the inlet of said outlet pipe into said catch basin for easy extraction of the flow restrictor from said outlet pipe.

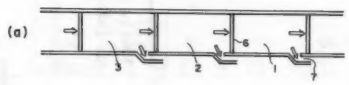
9. The sewer system of claim 8 wherein the aperture of the flow restrictor is in the form of an n sided polygon where n is an integer greater than 2.

4,522,534

CONTROL METHOD FOR OPEN CHANNEL

Fumio Wakamori, Machida; Toshiyuki Noma, Ibaraki; Masao Adachi, Yokohama; Motohisa Funabashi, Sagamihara, and Masayoshi Suzuki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 577,971
Claims priority, application Japan, Feb. 23, 1983, 58-27561
Int. Cl.³ E02B *13/00*
U.S. Cl. 405—37 **6 Claims**



1. A control method for an open channel performed by using an open channel control system comprising gate means for opening and closing the open channel, estimating means for estimating values of parameters of a state in a plurality of reaches into which the open channel is divided by said gate means, and control units for controlling a degree of opening of the gate means on the basis of estimated values of the parameters of a state, such method comprising the steps of:

representing each of the reaches by a three water tank model comprising three imaginary water tanks connected in series with one another and two imaginary conduits connecting the two adjacent imaginary water tanks with each other;

selecting, as the parameters of a state, liquid levels of the imaginary water tanks, flow rates in the imaginary conduits and a flow rate of diverted water from the reach;

providing the three water tank model with equations including the selected parameters of a state;

estimating, in the estimating means, future values of the selected parameters of a state by solving the equations;

determining, in the control unit, the degree of opening of the gate means so as to keep a liquid level of the reach constant on the basis of the estimated future values of the selected parameters of a state.

4,522,535

SURF WAVE GENERATOR

Dirk Bastenhof, Langerak, Netherlands, assignor to Ecopool Design Limited, Channel Islands

Filed Aug. 8, 1983, Ser. No. 521,113
Int. Cl.³ F04D *35/00*
U.S. Cl. 405—79 **10 Claims**

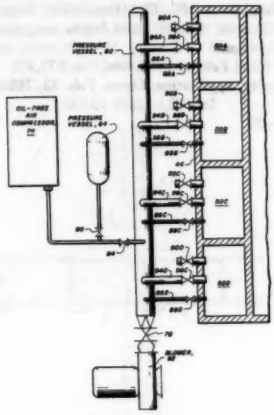
1. For use with a swimming pool, a surf wave generator comprising:

one or more air chamber extending at least partially along one side of said swimming pool, having an opening allowing the lower portion of the chamber to communicate with the lower portion of the swimming pool;

a reservoir of compressed air; and

means to rapidly induce said compressed air from said reser-

voir into said air chamber, displacing water therein into said swimming pool;



said reservoir having sufficient volume of compresed air to propagate a single travelling wave within said pool.

4,522,536

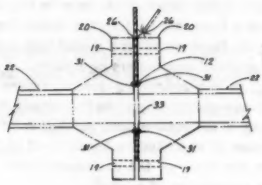
APPARATUS FOR AND METHOD OF FLUID SEALING CHANNELED FLANGE CONNECTORS OF UNDER-WATER PIPE LINE SECTIONS

Sharon J. Vidrine, Star Rte. Box 279-A, Washington, La. 70589

Filed Aug. 8, 1983, Ser. No. 520,929

Int. Cl.³ F16L *17/06*

U.S. Cl. 405—168 **2 Claims**



1. Apparatus for fluid sealing channeled flange connectors or underwater pipe line sections, said flange connectors having inner and outer perimeters and opposing annular faces, each defining a circular face channel, and therebeyond a concentric circle of transverse bolt holes for fastening bolts to engage therein, said apparatus comprising:

(a) annular body means defining an inner perimeter, having a greater radius than said flange connectors inner perimeters, for engaging an o-ring sealer adapted to fit in said circular face channels, and defining an outer perimeter adapted to tangentially engage all said bolt holes with said o-ring sealer opposite said flange connectors face channels;

(b) tab means unitary with said annular body and projecting radially outward, normal to and in the place thereof, and scored for breaking flush with outer perimeters of said flange connectors; and

(c) a thumb piece unitary with said tab means and extending transversely and in the plane thereof for manually grasping and inserting said annular body and o-ring sealer between said face channels and in engagement therewith, and for breaking off with a part of said tab means at said score thereafter.

4,522,537

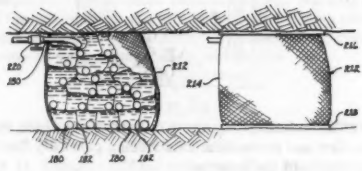
ICE CRIB

David L. Kuck, Oracle, Ariz., assignor to Iceberg Cribs, Inc., Oracle, Ariz.

Filed May 7, 1982, Ser. No. 376,254

Int. Cl.³ E21D *15/00*

U.S. Cl. 405—288 **25 Claims**



1. An ice crib for filling a space to support an underground roof, said ice crib comprising in combination:

(a) a double walled tubing including a first tube and a second tube, said first tube being an outer tube and said second tube being an inner tube of said double wall tubing;

(b) means for introducing a first fluid into said first tube;

(c) means for conveying through said second tube a second fluid having a lower freezing point than the first fluid and at a temperature below the freezing point of the first fluid; and

(d) means for conforming said ice crib to fill the predetermined space upon introduction of the first fluid and conveyance of the second fluid;

whereby, the second fluid will draw heat from the first fluid to freeze the first fluid and develop said ice crib of solid mass sized commensurate with the predetermined space to be filled.

4,522,538

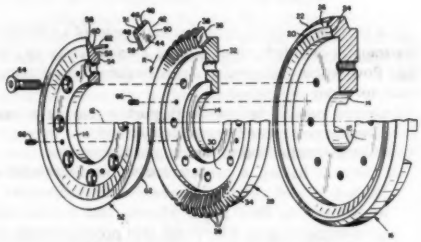
MILLING CUTTER WITH MULTIPLE INDEXABLE CUTTING INSERTS

Harold W. Lindsay, 2451 NW. 30th, Portland, Oreg. 97210

Filed Nov. 7, 1983, Ser. No. 549,475

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—35 **3 Claims**



1. A milling cutter comprising,

a body having an annular surface concentric with the axis of the cutter and located inwardly from one end of the body, the body having a rim extending radially outwardly of the annular surface, the rim having an annular seating surface formed thereon, the rim forming a lip around the seating surface;

a spacer ring having a first annular exterior surface and a second annular exterior surface parallel to the first surface and adapted to contact the annular surface of the body, the spacer ring being seated in contact with the body, the spacer ring having a rim, the spacer ring rim having a

surface generally congruent to the annular seating surface of the body rim such that said last-named surface is adjacent but not in contact with the annular seating surface of the body rim when the spacer ring is seated in contact with the body, the spacer ring rim having a plurality of generally radial slots extending completely therethrough;

a cutting insert received in each of the slots in the spacer ring rim, the cutting insert having a plurality of sides formed between parallel faces, a first side of the cutting insert being supported by the annular seating surface of the body rim, the lip thereof being adapted to prevent radially outward movement of the insert;

a retaining ring having an exterior surface generally congruent to the first annular surface of the spacer ring, a portion of the exterior of the exterior surface of the retaining ring being adapted to engage a second side of the cutting insert; and

means clamping the retaining ring, the spacer ring and the body together, whereby the insert-engaging portion of the exterior surface of the retaining ring clamps the insert against the annular seating surface of the body rim.

4,522,539

DOWELLING JIG

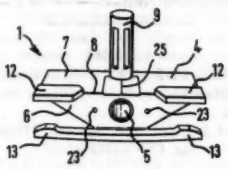
Andrew R. Gibbs, Stockton Near Rugby, England, assignor to Stanley Tools Limited, Sheffield, England

Filed Feb. 14, 1983, Ser. No. 466,291

Claims priority, application United Kingdom, Mar. 2, 1982, 8206004

Int. Cl.³ B23B *49/02*

U.S. Cl. 408—72 R **10 Claims**



1. A dowelling jig for use in drilling dowel-holes for dowels, comprising a body member having two mutually perpendicular faces which intersect along a reference-edge line, a through-hole therein to guide a drill extending perpendicularly to and opening onto a first one of said faces, means to locate said body member upon an edge of a piece of boarding so that the through-hole is positioned to guide the drill for drilling a dowel-hole in the edge of the piece of boarding with the boarding edge engaging against said first face, said locating means having abutment means coplanar with the second face to locate one face of the piece of boarding substantially coplanarly with said second face of the body member at said reference-edge line for the drilling of the dowel-hole in the edge of the piece of boarding, and a peg in a fixed position spaced from the reference-edge line and projecting perpendicularly from the second one of said faces of the body member perpendicularly to the axis of the through-hole such that the peg can be located in the dowel-hole drilled in the edge of the piece of boarding with said boarding edge engaged against said second face for locating said through-hole for drilling a corresponding dowel-hole in another member for dowelling the piece of boarding to said other member.

4,522,540

METHOD AND APPARATUS FOR REMOVING CUTTING BURR STICKING TO LOWER SURFACE OF SLAB

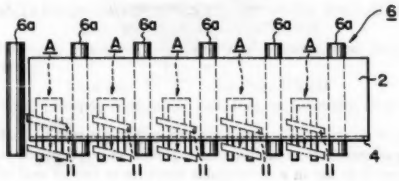
Nobuhisa Hasebe; Hiroshi Kawada, both of Yokohama; Naoki Yokoyama, and Shigeki Komori, both of Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,889

Claims priority, application Japan, Apr. 9, 1982, 57-58276; Apr. 9, 1982, 57-58277

Int. Cl.³ B23D *1/00, 1/26*

U.S. Cl. 409—293 **4 Claims**



1. A method for removing a cutting burr produced when longitudinally fusion-cutting a slab and sticking to the lower surface of said slab along the fusion-cutting line, which comprises the steps of:

placing at least one slab each having said cutting burr on a roller table extending horizontally with the lower surface having said cutting burr of said at least one slab down; fixing said at least one slab onto said roller table; lifting at least one cutter of at least one burr cutting machine provided below said roller table to bring said at least one cutter into contact with said lower surface having said cutting burr of said at least one slab; and horizontally moving said at least one cutter toward the line of said cutting burr of said at least one slab while keeping said contact with said lower surface to cut off said cutting burr by means of a knife of said at least one cutter;

characterized by:

placing a slab having said cutting burr on said roller table so that the line of said cutting burr agrees with the travelling direction of said roller table;

transferring said slab on said roller table up to the position of said at least one burr cutting machine, and fixing said slab onto said roller table;

horizontally moving said at least one cutter of said at least one burr cutting machine toward the line of said cutting burr of said slab in the direction intersecting the travelling direction of said roller table substantially at right angles until said at least one cutter passes the line of said cutting burr, to cut off a part of said cutting burr of said slab by a length corresponding to the total length of a knife of said at least one cutter by means of said knife of said at least one cutter, and horizontally pulling said at least one cutter back to the original position thereof;

after releasing said fixing of said slab, forwarding said slab on said roller table in the travelling direction of said roller table by a distance substantially equal to said total length of said knife of said at least one cutter; and,

repeating at least once said cut-off of said cutting burr of said slab by means of said at least one cutter, thereby substantially completely removing said cutting burr of said slab.

4,522,541

STUD FASTENER RECEPTACLE

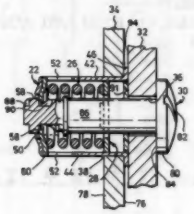
Richard H. Bidwell, Farnham, England, assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed May 5, 1983, Ser. No. 492,148

Claims priority, application United Kingdom, May 10, 1982, 8213497

Int. Cl.³ A44B *17/00*

U.S. Cl. 411—554 **5 Claims**



1. A receptacle for receiving and securing a stud to enable a pair of members to be fastened together, said receptacle being mounted in use in a rectangular aperture in one of said members, and said receptacle comprising a housing for location in said aperture, said housing being substantially U-shaped and comprising a base at one end and a pair of depending opposed substantially flat legs defining an axial direction of said receptacle, each of the legs having an outwardly extending flange at its end remote from the base for engaging the front face of said one member, the sides of said legs preventing rotation of said receptacle in said aperture, and a non-circular element rotatable in said housing between a first position in which it is withdrawn from engagement with the rear face of said one member and a second position in which it is engaged with said rear face of said one member; and means for securing said stud within said receptacle, wherein each of said legs has an inturned flange disposed along each side, said flanges partially closing the sides of said receptacle between said legs, one diametrically opposite pair of said flanges defining a slot transverse to the axis of said receptacle and the pair of opposed ones of said flanges on each side of said receptacle defining therebetween an elongate slot extending between the end of the flanges remote from the base and the respective transverse slot, said non-circular element being rotatable in said housing between a first position in which it is held in said transverse slot and a second position in which it is located in said elongate slots and biased in use against the rear face of said member by said spring to lock said receptacle on said member.

4,522,542

APPARATUS FOR PRODUCING FINISHED BOOKLETS

James C. Minor, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1983, Ser. No. 484,068

Int. Cl.³ B42C *1/00, 3/00, 19/00*

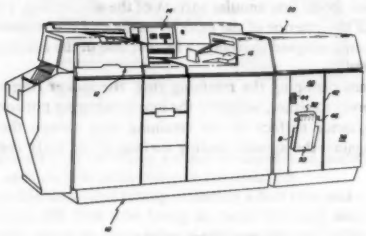
U.S. Cl. 412—25 **15 Claims**

1. In apparatus for receiving a plurality of sheets and producing booklets, the apparatus having (1) an assembly station inside the apparatus where a set of sheets are assembled together to from a booklet, (2) a collection station inside the apparatus for receiving booklets delivered from the assembly station, and (3) a housing substantially enclosing the assembly station and the collection station, the housing having a door movable between (i) a closed position for limiting access by an operator to the collection station and (ii) an open position for permitting an operator to remove booklets in the collection station, the improvement comprising:

means defining a passage for a booklet from inside the housing to a position spaced from the stations and where the booklet is outside the housing and accessible to an operator without opening the door; and

means for engaging a booklet after it is assembled in the assembly station and for delivering the booklet into the passage without moving the door from its closed position to its open position.

6. In apparatus for producing finished booklets from sets of sheets fed seriatim to the apparatus, the apparatus having (1) a housing, (2) an assembly station inside the housing where a set of sheets can be assembled and secured together to form a booklet, (3) a collection station inside the housing for receiving a plurality of finished booklets from the assembly station, and



(4) means for transporting a finished booklet along a path from the assembly station to the collection station, the housing having a door movable between an open position and a closed position, the door when in its closed position being effective to limit access by an operator to the assembly station and the collection station; the improvement comprising:

means on the outside of the housing for holding a booklet;

an opening in the housing defining a passage for a booklet from inside the housing to the holding means; and

means for engaging a booklet after it is produced in the assembly station and for delivering the booklet through the passage into the holding means without moving the door from its closed position.

4,522,543

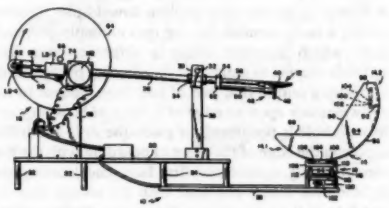
DEVICE FOR FEEDING INVALIDS

Eric Robinson, Manchester, N.H., assignor to Robert Rigoli, Norfolk, Mass.

Filed Jan. 23, 1984, Ser. No. 572,846

Int. Cl.³ A47G *21/08*

U.S. Cl. 414—9 **19 Claims**



1. Apparatus for feeding invalids comprising a spoon for presenting a portion of food to the invalid, a receptacle for containing food, means for supporting and moving the spoon from an at-rest position above the receptacle in a vertical orbit from said at-rest position above the receptacle into the receptacle along an arcuate path such that the spoon is plunged into the receptacle and then raised from the receptacle to a generally horizontal position and moved along a generally rectilinear path to present the portion of food contained by the spoon to the invalid and a scraper located in the path of said rectilinear movement of the spoon to remove excess food carried by

the spoon before the spoon leaves the receptacle to return the excess food to the receptacle, said means being operable to retract the spoon following a predetermined interval to said initial at-rest position.

4,522,544

HANDLING SHEETS OF MATERIAL

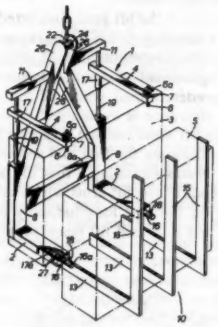
Ramesh C. R. Shah, Greater Manchester; Hugh J. Clare, Merseyside, and Ronald F. Berry, Nr. Wigan, all of England, assignors to Pilkington Brothers p.l.c., St. Helens, England

Filed Nov. 2, 1982, Ser. No. 438,481

Claims priority, application United Kingdom, Nov. 10, 1981, 8133875

Int. Cl.³ B66C *1/24, 1/34*

U.S. Cl. 414—330 **9 Claims**



1. A sheet handling device for moving a batch of sheets relatively to a stack of vertically supported sheets, comprising lower support means for supporting the lower edges of the batch, upper support means for engaging the back sheet of the batch to maintain the batch substantially vertical, and means for moving the lower support means in order to move the batch relatively to the stack, and wherein said lower support means includes slidable extension means for extending the length of the lower support means as a batch is separated horizontally from a stack.

4,522,545

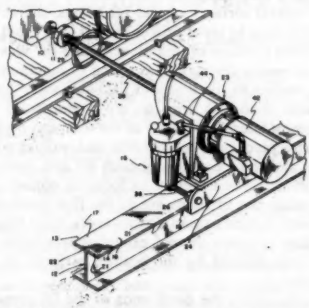
HOPPER CAR GATE OPENER AND METHOD OF OPERATING A HOPPER CAR GATE

George W. Peckham, Derby, Kans. 67037

Filed Oct. 11, 1983, Ser. No. 540,760

Int. Cl.³ B65G *67/24*

U.S. Cl. 414—376 **9 Claims**



1. In a freight hopper car of the type having a plurality of hoppers with rack and pinion operated gates individual to each hopper, the improvement comprising an elongated member having opposed flanges defining a fixed track, a trolley element mounted on the track supported by and movable along a top surface of each flange, a portion of said trolley element underlaying and spaced from a bottom surface of each flange, and a torque producing unit mounted on the trolley element operable to generate a twisting moment in a predetermined rotational direction to drive said pinion, reaction to said twisting moment being effective to rotate the trolley element relative to the track so that said portion of said trolley element underlaying said bottom surface moves into contact with said bottom surface of each flange effective to seize the trolley frictionally and releasably to the track.

4,522,546

CONTAINER-HANDLING SYSTEM WITH RAIL/RAIL AND ROAD/RAIL TRANSFER

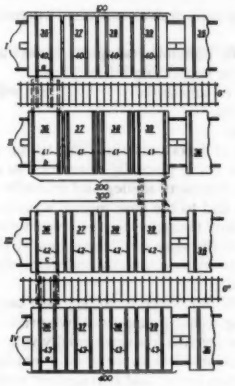
Karl Ringer, Frauenberg 30, 7967 Bad Waldsee, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,294

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136687

Int. Cl.³ B65G *67/00*

U.S. Cl. 414—343 **8 Claims**



1. In a railroad station having at least one main track for freight trains with container-carrying flatcars,

the combination therewith of a pair of ancillary tracks flanking said main track, respective sets of independently movable self-propelled transfer vehicles on said ancillary tracks, and support means on each transfer vehicle extendable transversely to said tracks for enabling the movement of a selected container onto such vehicle from a flatcar aligned therewith and vice versa, said support means being further extendable across at least part of said main track in the absence of a train thereon for facilitating a movement of a container from a transfer vehicle of one set onto an aligned transfer vehicle of the other set, each of said transfer vehicles comprising a wheeled base and a pluality of independently elevatable superstructures adjoining one another in the longitudinal direction of the vehicle for engagement with individual unit-size containers occupying a submultiple of the length of a flatcar, said support means comprising a pair of transversely extending transport arms on each of said superstructures, the separation of the transport arms of each pair in the direction of the tracks being identical for all pairs on all transfer vehicles of one of said sets but differs from the separation of the transport arms of the pairs on the transfer vehicles of the other of said sets for enabling an interleaved position-

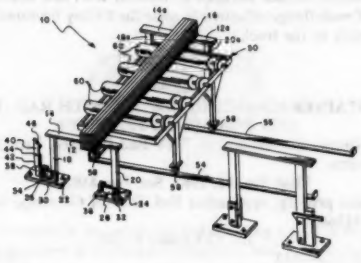
ing of pairs of transport arms of aligned vehicles of said sets extended toward each other across said main track.

4,522,547

HEAVY LOAD CONVEYOR SYSTEM

C. Staton Douthit, and Edward R. Kirby, both of Dallas, Tex., assignors to Associated Truss Company, Dallas, Tex.

Filed May 23, 1983, Ser. No. 496,844
Int. Cl.³ B65G *67/02*
U.S. Cl. 414—391 **8 Claims**



1. A heavy load conveyor system comprising in combination:

substantially horizontal support means having a working surface for supporting a heavy load;

a plurality of substantially vertical legs supporting the support means;

base means;

a plurality of links corresponding to the plurality of legs, each link being pivotally connected at one end to a leg near the bottom of the leg and pivotally connected at the opposite end to the base means, wherein the links are of substantially the same length between pivot points and are pivoted in the same direction whereby the support means can be moved horizontally and vertically by rocking the links; and

a removable link brace including two support surfaces for providing abutting support to two predetermined surfaces of at least one link in a substantially vertical position when said removable link brace is in an abutting support position, at least one of said two support surfaces being disengagable from said at least one link to allow said at least one link to be rocked from said substantially vertical positon.

4,522,548

AERIAL WEAPONS HANDLING TRAILER

Norman D. Oswald; Robert R. Dean, both of Duncanville, and Harry S. Mankey, Dallas, all of Tex., assignors to Standard Manufacturing Co., Inc., Dallas, Tex.

Filed Sep. 28, 1982, Ser. No. 426,220
Int. Cl.³ B60P *3/00*
U.S. Cl. 414—458 **19 Claims**

10. An aerial weapons handling trailer for receiving, transporting and lifting weapons packages characterized by a predetermined width comprising:

a frame including first and second longitudinally extending beams and a cross beam interconnecting the front ends of the longitudinally extending beams;

the longitudinally extending beams having inwardly facing surfaces spaced apart further than the predetermined width of the weapons package;

at least two front wheels and at least two rear wheels for supporting the front and rear ends of the frame, respectively;

means supporting the front and rear wheels for pivotal movement between first orientations wherein the wheels support the frame for movement in a direction extending substantially perpendicular to the longitudinally extending beams of the frame;

a plurality of lift arms;

means pivotally supporting the proximal ends of at least two of the lift arms on the first longitudinally extending beam of the frame with the lift arms extending substantially parallel to each other;

the lift arms being pivotable between a first position, wherein the distal ends thereof are disposed adjacent a plane defined by the bottom surfaces of the trailer wheels, and a second position, wherein the distal ends of said lift arms are disposed above the proximal ends thereof, the lift arms including:

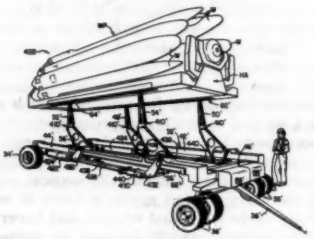
(a) first portions, including the proximal ends thereof;

(b) third portions, including the distal ends thereof; and

(c) offset portions rigidly interconnecting the first and third portions thereof;

the first portions of the lift arms supported on the first longitudinally extending beam being spaced from the first portions of the corresponding lift arms supported on the second longitudinally extending beam a distance greater than the predetermined width of the weapons package, such that clearance is maintained between the first portions of the lift arms and the weapons package as the lift arms pivot between the first and second positions;

a pair of lift beams including a first lift beam supported on the distal ends of the lift arms which are in turn pivotally supported on the first longitudinally extending beam of the frame and a second lift beam supported on the distal



ends of the lift arms which are pivotally supported on the second longitudinally extending beam of the frame;

the lift beams having outside surfaces which are spaced apart less than the inner surfaces of said first portions of said lift arms, thereby allowing said lift beams to be lowered between said first portions of said lift arms;

the outwardly facing surfaces of the third portions of the lift arms supported on the first longitudinally extending beam being spaced from the outwardly facing surfaces of the third portions of the corresponding lift arms supported on the second longitudinally extending beam a distance substantially no greater than the distance between the outermost lateral surfaces of said lift beams, thereby allowing said lift arms to pivot upwardly and insert said lift beams, said third portions of said lift arms and the weapons package upwardly through an opening of minimum clearance with respect to the weapons package, such that the third portions of the lift arms do not extend from within the outermost lateral periphery of the weapons package as the lift arms pivot between the first and second positions;

the first and third portions of each lift arm extending from the offset portion thereof to form an obtuse angle, such that when the lift arms are in the first position, the first portions thereof extend downwardly from the frame and the third portions thereof extend substantially parallel to the plane defined by the bottom surfaces of the trailer wheels;

means connecting the distal ends of the lift arms to the lift beams for pivotal movement with respect thereto; and

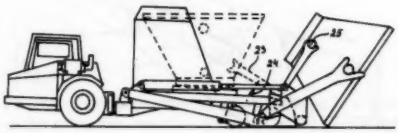
hydraulic cylinder means connected between the frame and lift arms for selective actuation to pivot the lift arms and thereby raise and lower the lift beams.

4,522,549

TRANSPORT VEHICLE FOR A SLAG RECEPTACLE

Karl-Erik Niva, Kiruna, Sweden, assignor to Kiruna Truck AB, Kiruna, Sweden

Filed Apr. 14, 1983, Ser. No. 485,097
Claims priority, application Sweden, Apr. 16, 1982, 8202397
Int. Cl.³ B60P 1/64
U.S. Cl. 414—474 **14 Claims**



1. A transport vehicle for a slag receptacle, comprising
an essentially rectangular load surface having a forward end for connection to a towing vehicle and a rearward end;
a wheel assembly mounted at the rearward end of said load surface and supporting said load surface on the ground;
a subframe comprising two longitudinally extending side beams, each having a first and a second end and a transversely extending cross-beam interconnecting said first ends of said two side beams, said subframe surrounding said load surface at three sides thereof, so that said cross-beam extends across the rearward end of said load surface, said second ends of said two side beams being connected to a front portion of said load surface;
two lifting arms adapted for engagement with a receptacle positioned behind the transport vehicle for lifting a receptacle upwardly and forwardly to said load surface and for lifting a receptacle upwardly and rearwardly to remove it from said load surface, each of said lifting arms being pivotally connected to said subframe at positions adjacent said first ends of said side beams;
at least two hydraulic lifting cylinders for powering said two lifting arms, said lifting cylinders being pivotally connected to and supported by said side beams and pivotally engaging said lifting arms for moving said lifting arms and thereby lifting a receptacle;
depending ground-engaging means connected to said cross-beam;
means for lowering said depending ground-engaging means to abut the ground for lifting of a receptacle and for raising said ground engaging means off the ground for transporting a receptacle.

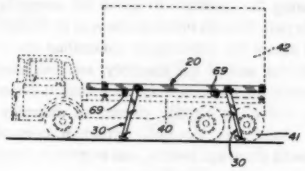
4,522,550

DETACHABLE PLATFORM FOR TRUCK BODY OR TRAILER

David N. Whitehouse, 1542 Woodland, Montreal, Quebec, Canada

Filed Aug. 2, 1983, Ser. No. 519,726
Claims priority, application Canada, Aug. 3, 1982, 408623
Int. Cl.³ B60P 1/64
U.S. Cl. 414—498 **5 Claims**

1. A detachable platform for supporting a container or the like, the platform being adapted for detachable mounting in a truck body or trailer, comprising
a substantially flat frame assembly having at least two hollow longitudinal structural beams,
at least four support legs mounted on the frame assembly, each leg having at least one extension member with a support pad at the base thereof, and a horizontal side extension portion at the top of the extension member, to extend the legs outboard of the frame assembly and permit the truck body or trailer to pass between the legs under the frame assembly,
a self-contained jacking means integral with the frame assembly having at least four jacking points for positioning on the truck body or trailer to raise the platform in a single lift off the truck body or trailer and permit the legs to be extended



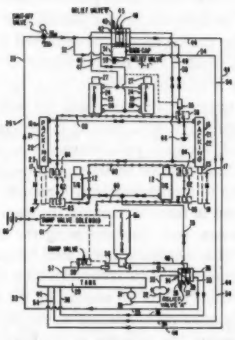
outward and lowered the jacking means includes at least one double acting hydraulic jack having a piston connected to two connecting means, each connecting means being connected to the piston and to linkage means at each jacking point, such that movement of the connecting means by the jack raises or lowers the platform from the jacking point.

4,522,551

REFUSE STORAGE AND DISCHARGE APPARATUS

James W. Henneberry, 170 Brixton Rd. S., Garden City, N.Y. 11530

Filed Apr. 18, 1983, Ser. No. 485,725
Int. Cl.³ B65F 3/28
U.S. Cl. 414—517 **7 Claims**



1. Refuse storage and discharge apparatus comprising
a longitudinal container having a rearward end defining an opening and a forward end containing a hydraulically actuated multistage telescopic cylinder device longitudinally relatively movable between a retracted position adjacent the forward end and an extended position generally spanning the distance between the forward and rearward ends,
the device being adapted to be operatively connected to an ejector panel for moving the panel longitudinally rearwardly through the container from the vicinity of the forward end to the vicinity of the rearward end upon actuating the device from its retracted position to its extended position for discharging through the opening refuse store in the container rearwardly of the panel,
a hydraulically actuated compacting piston-cylinder assembly disposed rearwardly of the opening and longitudinally relatively movable reciprocally along a stroke path having an amplitude defined between a rearward initial position generally rearwardly of the opening and a forward final position generally adjacent the opening,

the assembly being adapted to be operatively connected to refuse pushing means for conveying successive refuse portions forwardly into the container and for increasingly compacting each such conveyed refuse portion forwardly against the ejector panel or against the cumulative previously compacted successive refuse portions situated between the pushing means and the ejector panel upon actuating the assembly to move the assembly along the stroke path from its initial position to its final position, and

control means for individually controlling the actuation of the device and of the assembly, and including a device hydraulic fluid circuit, a device actuation control valve, a dump valve, an electric circuit, an assembly hydraulic fluid circuit, an assembly actuation control valve, a threshold electrical switch, and amplitude limiting switch means,

the device fluid circuit being adapted to be connected to a pressure source of hydraulic fluid, and containing the device control valve arranged for independent operation to supply hydraulic fluid to the device for moving the device rearwardly to its extended position and to lock hydraulically the device operatively in its extended position under static hydraulic pressure and against discharge of such fluid therefrom and in turn against forward movement of the device toward its retracted position, and also containing the dump valve arranged as a normally closed electrically energizable dump valve in the electrical circuit for intermittent energization to open the dump valve, independently of the operation of the device control valve, for intermittent periods of time to discharge incremental amounts of the static pressure fluid from the device to permit in turn concordant incremental forward movement of the device toward its retracted position,

the assembly fluid circuit being adapted to be connected to a pressure source of hydraulic fluid, and containing the assembly control valve arranged for independent operation to supply hydraulic fluid to the assembly for moving the assembly along its path forwardly from its initial position to its final position under an increasing dynamic fluid pressure up to a predetermined threshold operating fluid pressure and in turn for moving the assembly back to its initial position, and also containing the threshold switch arranged as a normally open and temporarily closable hydraulic pressure responsive threshold electrical switch in the electrical circuit for energizing the dump valve and operatively pressure connected to the assembly fluid circuit for sensing the pressure of the fluid supplied to the assembly and for automatically closing the threshold switch temporarily each time the predetermined threshold fluid pressure is reached during forward movement of the assembly toward its final position so as to energize the dump valve for incremental forward movement of the device automatically toward its retracted position under the dynamic pressure of the fluid supplied to the assembly until such pressure decreases to below the predetermined threshold fluid pressure and thereby permit continued optimum compacting forward movement of the assembly toward its final position, and

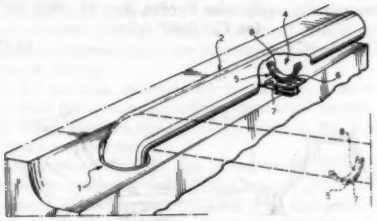
the amplitude limiting switch means being arranged as normally closed switch means in the electrical circuit and selectively positioned adjacent the stroke path for operative actuation by the assembly for opening the switch means to limit the electrical energization of the dump valve to the amplitude between the initial position and final position of the assembly independently of the pressure sensed by the threshold switch.

4,522,552

COMBINE HARVESTERS

Giuseppe Raineri, Bassano del Grappa, Italy, assignor to Pietro Laverda S.p.A., Breganze, Italy

Filed May 26, 1983, Ser. No. 498,439
Claims priority, application Italy, Jun. 3, 1982, 67715 A/82
Int. Cl.³ B60P *1/40*
U.S. Cl. 414—523 **2 Claims**



1. A combine harvester including a grain storage tank, an orientable discharge tube for discharging grain from the tank, and a hydraulic jack for moving the discharge tube between an extended position in which it projects from the combine harvester, and a retracted position in which it is housed within the space occupied by the combine harvester, wherein the improvement comprises catch means which are snap-engageable by the discharge tube when the latter is brought into its retracted position so as to lock the discharge tube in this retracted position and hydraulically controlled actuator means for releasing the catch means when the hydraulic jack moves the discharge tube towards the extended position,

wherein the said catch means includes a catch member carried by the structure of the combine harvester, a striker member carried by the discharge tube for cooperation with the catch member to lock the discharge tube in its retracted position, and resilient means biassing the catch member towards an active position of restraining the striker member, said striker member and said catch member having respective cam surfaces arranged to cooperate with each other to allow snap-engagement when the discharge tube is brought into its retracted position, and

wherein said actuator means includes a single-acting hydraulic cylinder arranged to move the catch member away from its active restraining position against the action of the resilient means, said single-acting hydraulic cylinder having an active chamber which communicates with the chamber of the hydraulic jack which is supplied with pressurized fluid when the hydraulic jack moves the discharge tube towards its extended position.

4,522,553

COMBINE POWER BOOST SYSTEM

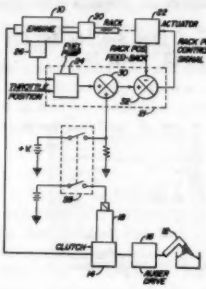
Leon F. Nelson, Cedar Falls; Dan T. Montgomery, Waterloo, both of Iowa; Michael K. Wyffels, Geneseo, Ill., and William J. Sikula, Jr., Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 13, 1982, Ser. No. 417,236
Int. Cl.³ B60P *1/42*
U.S. Cl. 414—526 **6 Claims**

1. In an engine-driven combine having an unloading auger powered by the engine and capable of being operated while the combine is traveling, an engine power control system comprising:

switch means manually operable to activate and de-activate the unloading auger; and

control means coupled to the switch means for momentarily increasing power produced by the engine to prevent reduction of combine travel speed in response to activation of the unloading auger by operation of the switch means.



4,522,554

TRACTOR FRONT LOADER

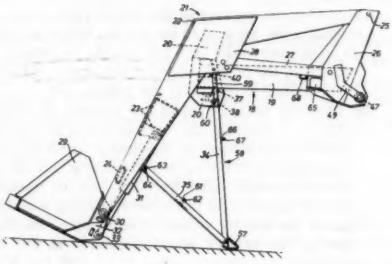
Frederick Williams, Warrington, and Anthony D. Coe, Manchester, both of England, assignors to David Brown Tractors Ltd., Meltham, England

Filed Nov. 18, 1983, Ser. No. 553,261

Claims priority, application United Kingdom, Nov. 24, 1982, 8233529

Int. Cl.³ E02F 3/70

U.S. Cl. 414—686 **3 Claims**



1. A front loader designed for drive-in attachment to a tractor, comprising front and rear bracket means adapted to be permanently secured to the tractor frame and a detachable main portion including a sub-frame adapted to be temporarily secured to the bracket means, a loader boom assembly pivotably mounted on the sub-frame, a loader bucket or the like pivotably mounted on the boom assembly, two hydraulic piston-and-cylinder assemblies disposed at respective sides of the boom assembly and pivotally connected between the sub-frame and points intermediate the length of the boom assembly for pivoting said assembly, and at least one hydraulic piston-and-cylinder assembly for pivoting the bucket, wherein two support struts disposed at respective sides of the boom assembly are pivotable between a stowed position, a first deployed position in which they support the rear end of the detachable main portion at drive-in height when it is not attached to the tractor, and a second deployed position in which they engage with abutments on the sub-frame and are secured to the hydraulic piston-and-cylinder assemblies for pivoting the boom assembly to lock said assembly in its fully raised position whilst the detachable main portion is attached to the tractor.

4,522,555

HANDLING APPARATUS

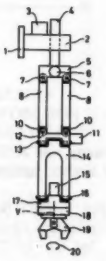
Toshitsugu Inoue, Kyoto; Akiyoshi Nakada, Suita; Haruo Kaji, Kadoma; Makoto Doi, Sakai, and Kuninori Takezawa, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 20, 1982, Ser. No. 420,571

Claims priority, application Japan, Sep. 25, 1981, 56-152779

Int. Cl.³ B25J 9/00

U.S. Cl. 414—733 **4 Claims**



1. Handling apparatus comprising:

first and second parallelogram linkage mechanisms having a common link, the pivotal axes of the links of said first mechanism being disposed at right angles to those of said second mechanism and the axes of said common link comprising said first mechanism being in a plane substantially parallel to a plane including the axes of said common link comprising said second mechanism;

holding means connected to a link of one of said mechanism opposite said common link;

first power-operated means connected to said first mechanism for angularly moving the connected links thereof relative to each other; and

second power-operated means independent of said first power-operated means connected to said second mechanism for angularly moving the connected links thereof relative to each other.

4,522,556

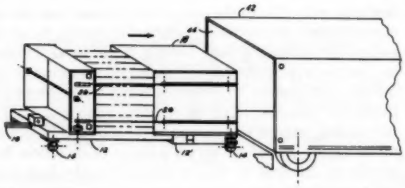
METHOD AND DEVICE FOR PACKAGING AND SHIPPING HIGH-LOFT BATTING

Sumner Shapiro, Albany, N.Y., assignor to Star Textile Research, Inc., Albany, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,549

Int. Cl.³ B65G 67/00

U.S. Cl. 414—786 **4 Claims**



1. A method of loading long objects into a truck compartment comprising:

placing said objects into a device having plungers and corresponding tubular cells arranged in the cross-sectional shape of said compartment with said plungers being arranged and positioned to move in and out of said cells as

said cells and plungers are moved with respect to each other;

moving said device into said compartment horizontally and

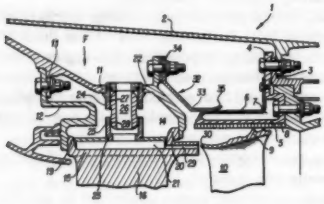
removing said objects from said cells without changing their relative spatial relationship by withdrawing said device from said compartment while said objects are maintained in a stacked configuration by said plungers.

4,522,557

COOLING DEVICE FOR MOVABLE TURBINE BLADE COLLARS

Jean G. Bouiller, Brunoy, and Jean-Claude L. Delonge, Corbeil-Essonnes, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Jan. 5, 1983, Ser. No. 455,732
Claims priority, application France, Jan. 7, 1982, 82 00121
Int. Cl.³ F01D *11/02*
U.S. Cl. 415—115 **5 Claims**



1. A cooling device for the peripheral shroud of movable blades of a turbine which includes a main flow through which gas circulates and including a rotor with a turbine ring forming a stationary part of said rotor, comprising:

a turbine nozzle located adjacent said movable blades and including a plurality of stationary turbine nozzle vanes;

an external chamber in communication with an air supply for providing cooling air to said stationary turbine nozzle vanes of said turbine nozzle and passing said air through a cavity portion formed adjacent said turbine nozzle vanes and to said turbine ring; and

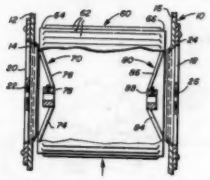
passage means in communication with said chamber for directing the air toward said peripheral shroud of the movable blades of the turbine rotor for ensuring cooling of said shroud from a leading edge portion thereof located on an upstream side thereof in relation to the direction of said gas circulation in the main flow wherein said passage means further comprises a plurality of cooling holes and means for calibrating said cooling holes so as to allow precise control of the rate of cooling air flowing to said shroud, said cooling holes further being circumferentially slanted for directing along an optimum angle jets of air on said leading edge of said shroud of the movable blades and for obtaining jets of air within a range of direction from parallel to the flow to slightly opposed to the flow without a centripetal radial component and wherein said leading edge portion of said shroud further comprises a raised profile downstream of said cooling holes, said profile being raised in relation to the extension of the shroud itself, thereby allowing a more efficient impingement cooling of said leading edge and a more efficient cooling of said shroud by an improved flow on an internal side of said shroud.

4,522,558

BLOWER WHEEL APPARATUS

Edward J. Johnson, Tempe, and Robert L. Koble, Jr., Phoenix, both of Ariz., assignors to Phoenix Manufacturing, Inc., Phoenix, Ariz.

Filed Jan. 3, 1984, Ser. No. 567,678
Int. Cl.³ F04D *29/28*
U.S. Cl. 416—187 **16 Claims**



1. Blower wheel apparatus having a first overall width for installation into a blower housing having a pair of sides spaced apart from each other and a pair of circular openings aligned with each other in the sides and in which are disposed bearing means in which a shaft rotates, and the blower wheel apparatus further having a second width between the pair of sides of the blower housing less than the first overall width of the blower wheel apparatus, the blower wheel apparatus comprising, in combination:

rim means, including a first rim and a second rim spaced apart from each other and a plurality of blades secured to and extending between the first and second rims; and

spider means, including

a first spider secured to the first rim,

a first collar secured to the first spider and adapted to be secured to the shaft for rotating the blower wheel apparatus,

a second spider secured to the second rim,

a second collar secured to the second spider and adapted to be secured to the shaft for rotating the blower wheel apparatus, the overall width of the blower wheel apparatus defined as including the collars, and

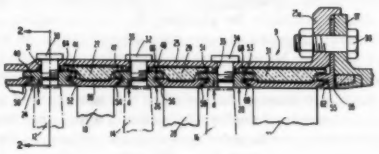
the first and second spiders are adapted to deflect inwardly to decrease the overall width of the blower wheel apparatus to allow the blower wheel apparatus to be inserted into a blower wheel housing, and adapted to deflect outwardly after insertion into the housing and into the openings of the blower housing and disposed against the bearing means for securing to the shaft for rotating the blower wheel apparatus in the blower housing.

4,522,559

COMPRESSOR CASING

Joseph C. Burge, and Julius Bathori, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 350,490, Feb. 19, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 632,691
Int. Cl.³ F01D *11/08*
U.S. Cl. 415—196 **16 Claims**



1. A turbomachine casing surrounding a rotor comprising:

an outer casing wall;

a sectored inner casing wall;

means for insulating said inner wall from said casing; and

means for removably attaching said inner casing wall to said outer casing wall, such that during transient operation of said turbomachine expansion of said inner casing wall initially occurs in the circumferential direction, after which said outer casing wall and inner casing wall expand radially in a substantially uniform manner, and wherein said rotor in said turbomachine radially expands substantially in concert with said casing.

4,522,560

LIQUID-RING COMPRESSOR FOR GASES

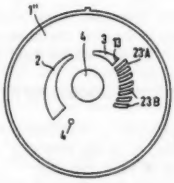
Wilfried Lubke, Ammerndorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,008

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210161

Int. Cl.³ F04C *19/00*

U.S. Cl. 415—210 **11 Claims**



1. In a control disc of a liquid-ring compressor having an impeller with a multiplicity of radially extending blades, said control disc being provided with a sickle-shaped suction slot and a sickle-shaped pressure slot having a substantially radial leading edge, said control disc being further provided with a multiplicity of ancillary pressure openings disposed in an arc-shaped region extending circumferentially in front of said pressure slot, as determined by the direction of rotation of said impeller, said arc-shaped region extending in a radial direction beyond the outer end of said leading edge,

the improvement wherein said pressure openings are substantially radially extending slots spaced from each other in the circumferential direction, the ratio of the widths of the slots to the thickness of the blades of the impeller being less than 1.2 to 1, said control disc having a planar surface on a side facing said impeller, said blades having an arcuate cross-section in a plane parallel to said surface and said radially extending slots having, in the plane of said surface, an arcuate shape substantially identical in curvature to said cross-section.

4,522,561

WIND-DRIVEN GENERATOR APPARATUS

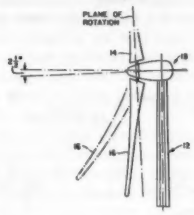
J. Warne Carter, Jr., Burkburnett, and J. Warne Carter, Sr., Wichita Falls, both of Tex., assignors to Carter Wind Power, Wichita Falls, Tex.

Division of Ser. No. 173,700, Jul. 30, 1980, Pat. No. 4,431,375, which is a continuation-in-part of Ser. No. 37,774, May 10, 1979, Pat. No. 4,366,387. This application Jun. 6, 1983, Ser. No. 501,369

Int. Cl.³ F03D *7/04*

U.S. Cl. 416—11 **6 Claims**

1. Wind-driven apparatus including a head assembly for supporting a rotor shaft, rotor blade means, hub means for supporting said blade means on said rotor shaft, means for supporting said head assembly for weathervaning rotation about a substantially vertical axis, and damping means responsive to rotational movement of said head assembly about said



axis for applying shearing forces to a high viscosity liquid to damp said rotational movement.

4,522,562

TURBINE ROTOR COOLING

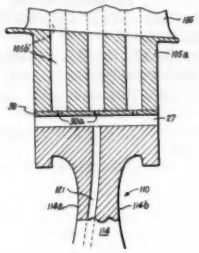
Pierre A. Glowacki, Melun, and Gérard M. F. Mandet, Epinay sous Senart, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.-M.A., Evry, France

Filed Nov. 21, 1979, Ser. No. 97,741

Claims priority, application France, Nov. 27, 1978, 78 33382

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—95 **7 Claims**



1. A turbine disc having means therein for circulating a cooling fluid for the blades supported by the disc, said cooling fluid circulating means comprising channels non-radially bored therein respectively close to each of the sides of the disc and conforming with their profile, the sides of the disc and the channels having a curved profile, advantageously in the shape of an arc of a circle, and the channels leading to the middle of the length of the cups which support the stem of the blades.

4,522,563

ELASTOMERIC SYSTEM FOR MOUNTING A HELICOPTER ROTOR

Peter A. Reyes, Watauga, and Robert H. Finney, Arlington, both of Tex., assignors to Bell Helicopter Textron, Inc., Fort Worth, Tex.

Filed Jul. 6, 1982, Ser. No. 395,789

Int. Cl.³ B64C *11/12*

U.S. Cl. 416—134 A **2 Claims**

1. A system for mounting a teetering helicopter rotor onto a mast including:

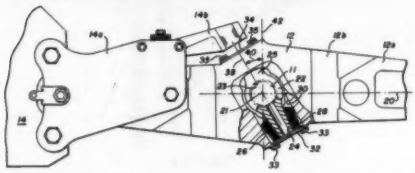
a main body having a central portion having a central bore therethrough for receiving the mast;

a pair of opposed conical shafts extending from said main body on a common axis which perpendicularly intersects the axis of said central bore;

elastomeric bearing rings having conical shims therein of the

same cone angle as the angle of said conical shaft and being circumferentially disposed around said conical shafts;

outer mounting rings having interior and exterior surfaces, said interior surfce having the same cone angle as the



angle of said conical shafts and being circumferentially disposed around said elastomeric bearing rings; and

tail rotor hub structure adapted to receive said exterior surface of said outer mounting rings for rotation with the rotor as it teeters on said common axis.

4,522,564

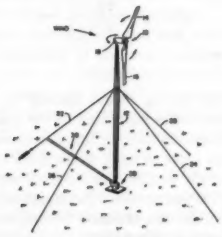
WIND-DRIVEN GENERATOR APPARATUS

J. Warne Carter, Jr., Burkburnett, and J. Warne Carter, Sr., Wichita Falls, both of Tex., assignors to Carter Wind Power, Wichita Falls, Tex.

Division of Ser. No. 173,700, Jul. 30, 1980, Pat. No. 4,431,375, which is a continuation-in-part of Ser. No. 37,774, May 10, 1979, Pat. No. 4,366,387. This application Jun. 6, 1983, Ser. No. 501,370

Int. Cl.³ F03D *7/04*

U.S. Cl. 416—140 **1 Claim**



1. In wind-driven generator apparatus including rotor blade means, a rotor shaft, hub means supporting said blade means on said rotor shaft and electric generator means having a shaft which is to be rotated in a desired direction for effecting the generation of electricity and which is fixedly coupled to said rotor shaft for being driven in rotation by said rotor shaft, the improvement comprising, in combination, blade pitch control means and clutch means, said blade pitch control means including means for maintaining said blade means in a given pitch configuration during normal operating conditions and for permitting said blade means to pitch to a stall configuration to prevent substantial overspeeding of said rotor shaft and damper means for delaying the return of said blade means from said stall configuration to said given configuration, said clutch means being cooperable with said rotor shaft for permitting that shaft to rotate only in a direction corresponding to said desired direction of rotation.

4,522,565

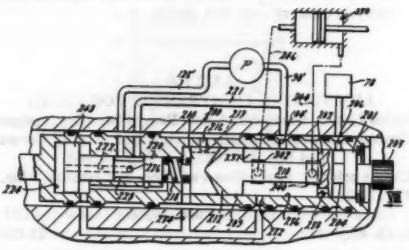
STEERING GEAR CONTROL VALVE FOR VARIABLE DISPLACEMENT PUMP

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 22, 1983, Ser. No. 487,650

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—220 **10 Claims**



1. A radial piston hydraulic pump comprising:

a housing having an interior chamber; and an inlet port and an outlet port through which fluid is carried to and discharged from the pump;

a rotor mounted within the chamber for rotation about a first axis;

a plurality of cylinders circumferentially spaced around and radially directed from the first axis;

a piston working in each cylinder;

means communicating the inlet and outlet ports with each cylinder;

a pumping ring mounted for arcuate movement about a second axis eccentric of the first axis having a guide surface extending over the outer periphery of the rotor with which the pistons maintain contact thereby causing the pistons to reciprocate in the cylinders as the rotor rotates;

a turn valve adapted for rotation about its axis in either direction from a neutral position adapted to open and close the pump outlet to first and second outlet ports in accordance with the direction of rotation;

a control pressure cylinder;

a control piston working in said control pressure cylinder in response to movement of the turn valve, whereby the volume of the control pressure cylinder is reduced and a control fluid compressed when the turn valve is rotated from its neutral position and whereby the volume of the control pressure cylinder is increased and a control fluid pressure reduced when the turn valve is rotated toward its neutral position; and

means responsive to the magnitude of control pressure for increasing and decreasing the amount of the eccentricity of the pumping ring with respect to the first axis, whereby the flow rate of the pump varies as the position of the turn valve varies from its neutral position.

4,522,566

ADJUSTABLE AXIAL PISTON PUMPS WITH REGLATING UNITS AND REGULATING UNITS FOR THE SAME

Horst Deininger, Horstein-Alzenau, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,066

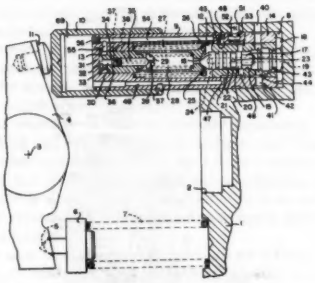
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3211307

Int. Cl.³ F04B *1/26*

U.S. Cl. 417—222 **12 Claims**

1. In an axial piston pump having a piston unit, a control bottom adjacent said piston unit, a swivellable final control

element spaced from the control bottom, said control element being capable of being swung out in one direction around a swivel axis from the zero-stroke position and on which a first force acting in the direction of the zero-stroke position engages on one side of the swivel axis and a second force acting in the direction to the maximum stroke position engages on the other side of the swivel axis, means producing the said first and second forces arranged at least approximately parallel to the axis of rotation of a cylindrical drum, the improvement com-



prising a section of said piston unit adjustable in the control bottom of the axial piston pump, a regulating unit in said section, an operating cylinder-servo piston unit connected to said final control element producing the force acting in the direction to the zero-stroke position, said regulating unit being built into the servo piston, said piston in turn being connected with the control bottom, wherein the operating cylinder of the piston unit acts together with the final control element and a spring acting in the direction to the maximum stroke position producing a change in position of the final control element.

4,522,567

SWASH PLATE COMPRESSOR

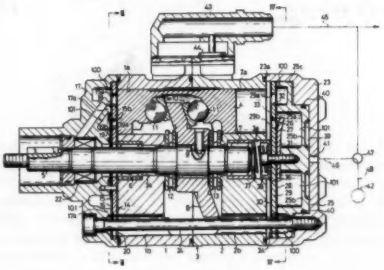
Kimio Kato; Hisao Kobayashi, both of Kariya; Takamitsu Mukai, Anjo; Hiroya Kono, Kariya, and Taku Yamamoto, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 359,951, Mar. 19, 1982, Pat. No. 4,413,955. This application Oct. 13, 1983, Ser. No. 522,427

Claims priority, application Japan, Mar. 28, 1981, 56-45864

Int. Cl.³ F04B *1/26, 1/16*

U.S. Cl. 417—270 **7 Claims**



1. A swash plate compressor with two operating stages at front and rear sections, comprising

a cylinder body member with front and rear housings connected thereto, said cylinder body member having a plurality of cylinder bores therein,

a plurality of pistons situated in said cylinder bores to be reciprocally moved therein,

a rotary shaft rotationally disposed in said cylinder body member, said shaft having a swash plate so that when the shaft rotates, the pistons are reciprocally moved by means of said swash plate,

an inner housing situated between said rear housing and said cylinder body member to form a pressure chamber between said inner housing and said rear housing, said pressure chamber, when operated, being pressurized so that said inner housing is moved relative to said cylinder body member, said inner housing having a rear wall at a side adjacent to the rear housing,

a valve assembly connected to said inner housing at a side adjacent to the cylinder body member, a portion of the rear wall of the inner housing being thinner than the thickness of the valve assembly so as to permit the rear wall to flex under the pressure applied to the pressure chamber so that the inner housing is uniformly pressed against the valve assembly to thereby sealing press the valve assembly onto the cylinder body member,

a discharge chamber formed between said inner housing and said valve assembly at the center portion of said inner housing, whereby said discharge chamber, when said pressure chamber is in operating condition, receives pressurized fluid formed by the pistons in the cylinder body member and leads the fluid from the compressor, and

a suction chamber surrounded by at least the inner housing and said valve assembly and located outside said discharge chamber, whereby said suction chamber, when said pressure chamber is in operating condition, receives fluid to be pressurized and supplies the fluid to the pistons.

4,522,568

COMPRESSOR APPARATUS

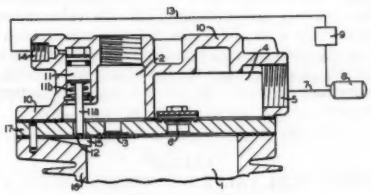
Hans-Dieter Gelse, Wunstrof; Werner Heger, Lehrte, and Manfred Kramer, Barsinghausen, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,601

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214713

Int. Cl.³ F04B *49/08*

U.S. Cl. 417—307 **9 Claims**



1. A compressor apparatus, for producing compressed gas, including a compression chamber within a cylinder body through which a piston moves with reciprocal motion, to periodically compress gas in the chamber, and suction and pressure chambers within the cylinder head, and further comprising:

(a) a valve plate connected between said cylinder body and said cylinder head, said valve plate and said cylinder body and said cylinder head forming a single assembly;

(b) at least one compressed gas communication passageway formed through said valve plate for communicating such compressed gas from said compression chamber into said pressure chamber during a compression stroke of said piston;

(c) a pressure valve means openable into said pressure chamber during said piston compression stroke positioned to sealingly engage said valve plate adjacent said compressed gas communication passageway on said pressure chamber side of said valve plate for closing said compressed gas

communication passageway during an intake stroke of said piston and for maintaining said compressed gas communication passageway closed when said compressor apparatus is in an idling condition;

(d) at least one uncompressed gas communication passageway formed through said valve plate for communicating such uncompressed gas from said suction chamber into said compression chamber during such intake stroke of said piston;

(e) a plate-type valve means openable into said compression chamber during said piston intake stroke positioned to sealingly engage said valve plate adjacent said uncompressed gas communication passageway on said compression chamber side of said valve plate for closing said uncompressed gas communication passageway during such compression stroke of said piston;

(f) a compressed gas storage reservoir coupled to receive and store compressed gas from said pressure chamber;

(g) at least one idle phase gas communication passageway formed through said valve plate for communicating uncompressed gas from said suction chamber into said compression chamber and from said compression chamber into said suction chamber during a respective intake stroke and compression stroke of said piston when said compressor apparatus is in such idling condition;

(h) an idle phase valve means positioned to sealingly engage said valve plate adjacent said idle phase gas communication passageway on said compression chamber side of said valve plate for sealably closing said idle phase gas communication passageway at least during such compression stroke of said piston when said compressor apparatus is in an operating condition;

(i) a compressor shifting means for shifting said compressor apparatus from such operating condition to such idling condition;

(j) an idle phase valve opening means connected to said compressor shifting means and positioned within said suction chamber to operatively engage said idle phase valve means through said idle phase gas communication passageway for maintaining said idle phase gas communication passageway continuously open during such idling condition of said compressor apparatus; and

(k) a recess area formed adjacent said idle phase valve means on at least one of said cylinder body and said valve plate and in gas communication with said compression chamber for receiving and preventing said idle valve means from interfering with said piston during a compression stroke thereby allowing minimum clearance between the bottom of said valve plate and the top of said piston while at the same time permitting the use of a plate-type suction valve means.

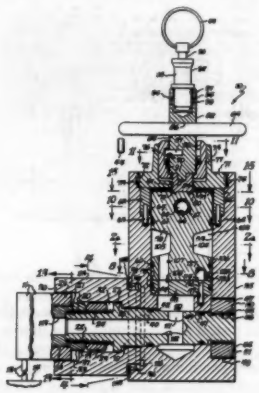
4,522,569

VENTING FUEL VALVE FOR DIESEL ENGINE FUEL SUPPLY SYSTEM

John H. Taylor, Orchard Park, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,301
Int. Cl.³ F02M *59/00*
U.S. Cl. 417—434 **8 Claims**

1. In a diesel engine fuel supply system having an injector pump, a fuel tank, a fuel inlet conduit between the fuel tank and the injector pump, and a fuel return conduit between the injector pump and the fuel tank, the improvement comprising a venting fuel valve including a valve body, mounting means for mounting said valve body on said injector pump, a fuel inlet on said valve body for receiving said fuel inlet conduit, a fuel outlet on said valve body for transmitting fuel to said injector pump, venting means in said valve body in communication with the atmosphere, valve means in said valve body movable between first and second positions, first conduit means in said fuel valve operable in said first position for effecting communication between said fuel inlet and said fuel outlet to supply fuel to said injector pump while preventing venting of said fuel outlet to the atmosphere through said venting means, second conduit means in said fuel valve operable in said second position for preventing communication between said fuel inlet and said fuel outlet and for effecting communication between said injector pump and the atmosphere through said fuel outlet and said venting means to thereby vent said injector pump and prevent flow of fuel through said fuel return conduit to said injector pump when said injector pump is caused to operate, a mounting member having a first mounting member portion for mounting on said injector pump, a second mounting member



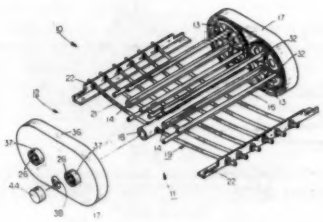
portion for mounting said valve body, means for locking said valve body on said mounting member, said mounting member comprising an elongated nipple-like member, and said first mounting member portion comprising a first threaded portion on one end of said nipple-like member, and said second mounting member portion comprising a central portion on said nipple-like member, and said means for locking said valve body on said mounting member comprising a second threaded portion at the other end of said nipple-like member, and a nut having an endless curvilinear groove mounted on said second threaded portion and received within a recess in said valve body.

4,522,570

PERISTALTIC PUMP APPARATUS

Charles O. Schartz, R.R. 2, Larned, Kans. 67550

Filed Jul. 11, 1983, Ser. No. 512,807
Int. Cl.³ F04B *43/12*
U.S. Cl. 417—475 **4 Claims**



1. In a peristaltic pump for pumping a substantially fluid substance from a source of said fluid substance, said pump including a first pump cell comprising a first set of at least one hose having one end operably connectable to a source of substantially fluid substance and a second end serving as an output for any substantially fluid substance moving therethrough, a rotating drive apparatus, first and second rotating members, said first rotating member being operably connected to said

rotating drive apparatus, and a first plurality of rollers operably connected between said first and second rotating members, such that as said first rotating member rotates, said first plurality of rollers operably contact said first set of at least one hose to urge a substantially fluid substance to move therethrough to said output, an improvement comprising a second pump cell, said second pump cell disposed substantially beside said first pump cell, said second pump cell including:

a second set of at least one hose having one end operably connectable to a source of a substantially fluid substance and a second end serving as an output for any substantially fluid substance moving therethrough;

a third rotating member being operably connected to said first rotating member such that when said first rotating member rotates, said third rotating member also rotates, and a fourth rotating member; and

a second plurality of rollers operably connected between said third and fourth rotating members; such that as said first rotating member rotates, said third rotating member rotates and thereby causes said second plurality of rollers to operably contact said second set of at least one hose to urge a substantially fluid substance to move therethrough to said output;

wherein said first and second plurality of rollers are comprised of rollers being substantially circular in cross section, and

wherein said first and third rotating members are substantially circular in shape and have gear teeth disposed about the peripheries thereof,

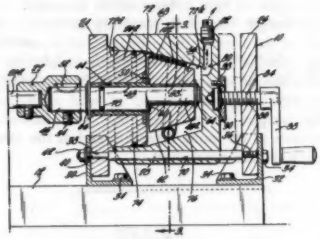
wherein said first and third rotating members physically contact one another such that the gear teeth disposed about the peripheries thereof are enmeshed, such that rotation of said first rotating member will cause said third rotating member to rotate.

4,522,571

PERISTALTIC PUMP

Robert K. Little, 519 Jacksonville Rd., Mt. Holly, N.J. 08060

Filed Mar. 5, 1984, Ser. No. 586,195
Int. Cl.³ F04B *43/12*
U.S. Cl. 417—476 **11 Claims**



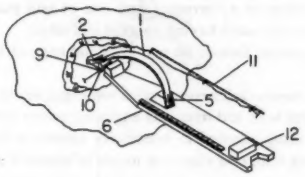
1. A peristaltic pump comprising a base member, said base member including a cylindrical portion extending therefrom, a shaft rotatably mounted in said base member concentric with said cylindrical portion, an eccentric portion of said shaft extending beyond said base member cylindrical portion, a roller rotatably mounted on said shaft eccentric portion, the peripheral surface of said roller having a frusto-conical configuration, an elastomeric tube disposed around said roller peripheral surface to form at least one full revolution therearound, a tube compressor, said tube compressor having a bore therein coaxial with said base member cylindrical portion, a portion of said tube compressor bore being cylindrical and overlying said base member cylindrical portion in slidable relation therewith, means for selectively controlling the axial position of said tube compressor with respect to said base member, said tube compressor bore continuing inwardly from said cylindrical portion in a frusto-conical portion parallel to and spaced from the frusto-conical peripheral surface of said roller, said tube compressor being selectively axially positionable to effect a deformation of said tube between the frusto-conical surfaces of said roller and said tube compressor, the rotation of said shaft causing an eccentric path of movement of said roller to effect a peristaltic pumping action on the contents of said tube, the output pressure of the pump being selectively variable and dependent upon the axial positioning of said tube compressor.

4,522,572

STRIKE INDICATOR AND HOOK SETTER, COMBINED

Paul L. Hahn, 150 Iris St., Broomfield, Colo. 80020

Filed Oct. 18, 1982, Ser. No. 417,631
Int. Cl.³ A01K *91/06*
U.S. Cl. 43—16 **1 Claim**



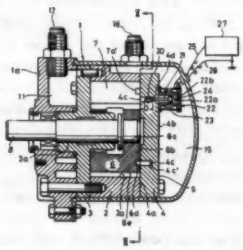
1. A combined strike indicator and hook setter adaptable to a fishing line and independent from a fishing pole comprising, a base, a removable spring arm attached to said base movable between a set and a released position, a releasable line holding means attached to a free end of said removable spring arm, a sear pivotably attached to said free end of said removable spring arm, a sear bar mounted on one end of said base, and a roll pin attached to an opposite end of said sear for holding said fishing line, said fishing line running from said fishing pole through said releasable line holding means around said roll pin and into the water such that a strike by a fish will pivot said sear away from said sear bar releasing said spring from said set position to said release position thereby setting the hook and simultaneously signalling the fisherman of the strike.

4,522,573

VARIABLE DELIVERY VANE COMPRESSOR

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,024
Claims priority, application Japan, Dec. 6, 1982, 57-213710
Int. Cl.³ F04C *18/00, 29/10*
U.S. Cl. 418—23 **6 Claims**



1. A variable delivery vane compressor comprising:

a cam ring having an endless camming inner peripheral surface and opposite open ends;

a pair of front and rear side blocks secured to said opposite open ends of said cam ring and cooperating with said cam

ring to define a pump housing, said pump housing having at least two pump inlets and at least two pump outlets;

a rotor rotatably received within said pump housing and having an outer peripheral surface formed with a plurality of axial slits, said rotor cooperating with said pump housing to define at least two spaces for forming pump working chambers, one of said pump outlets and one of said pump inlets opening in each of said spaces;

a plurality of vanes radially slidably fitted, respectively, in said axial slits in said rotor for sliding contact with said camming inner peripheral surface of said cam ring, adjacent ones of said vanes cooperating with said pump housing and said rotor to define said pump working chambers within each of said spaces during rotation of said rotor, said pump working chambers communicating with a corresponding one of said pump inlets or a corresponding one of said pump outlets, each of said vanes having an axial end edge;

engaging means formed on said axial end edge of each of said vanes;

arresting means disposed for selective engagement and disengagement with and from said engaging means, said arresting means being adapted to selectively assume a first position engaging with said engaging means in which it arrests each of said vanes in a retracted position in a corresponding one of said axial slits while said each vane is moving circumferentially in at least one of said spaces from a corresponding one of said pump inlets opening therein to a corresponding one of said pump outlets opening therein, and a second position disengaged from said engaging means in which said arresting means allows each of said vanes to slide on said camming inner peripheral surface of said cam ring while said each vane moves circumferentially in said at least one of said spaces;

control means for causing said arresting means to assume selectively said first position and said second position;

a drive shaft disposed in part within said pump housing for concentrically supporting said rotor, said rotor having one end face in which each of said axial slits opens at the axial end edge of a corresponding one of said vanes on which edge said engaging means is formed, one of said front and rear side blocks having one end face facing said one end face of said rotor,

said arresting means comprising a first annular groove formed in said one end face of said rotor concentrically of said rotor, a second annular groove formed in said one end face of said one of said front and rear side blocks and aligned with said first annular groove, and a holder arranged in said second annular groove for axial displacement into and out of said first annular groove, said holder circumferentially extending at least in said at least one of said spaces between a corresponding one of said pump inlets and a corresponding one of said pump outlets, so that when said first position is selected, said holder is displaced into said first annular groove and into engagement with said engaging means of each of said vanes to arrest said each vane in said retracted position in the corresponding one of said axial slits, and

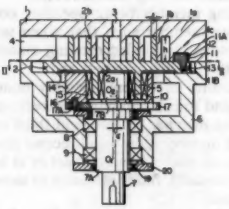
wherein said holder has one end closer to said corresponding one of said pump inlets, another end closer to said corresponding one of said pump outlets, and a lateral side edge closer to said rotor, said holder being tapered in a manner such that said holder has a width gradually decreasing from said one end to said another end thereof and is projected from said second annular groove by an amount gradually increasing toward said one end thereof when said first position is selected.

4,522,574

BALANCING WEIGHT DEVICE FOR SCROLL-TYPE FLUID MACHINE

Nobukatsu Arai, and Naoki Maeda, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,225
Claims priority, application Japan, Oct. 27, 1982, 57-187409
Int. Cl.³ F01C *1/04, 17/06, 21/02*
U.S. Cl. 418—55 **13 Claims**



1. A scroll-type fluid machine comprising a stationary scroll member provided with a spiral wrap of predetermined thickness and height, an orbital scroll member provided with a spiral wrap of predetermined thickness and height and a boss having a bore therein, said scroll members being assembled together with the spiral wraps thereof meshing with each other, a crankshaft having an eccentric shaft portion, bearing means for enabling an engagement between the eccentric shaft portion and said orbital scroll member, rotation prevention means for preventing rotation of said orbital scroll member around its own axis so that said orbital scroll member performs an orbital movement with rotating around its own axis while being driven by said crankshaft, balancing weight means for producing a centrifugal force acting in a direction opposite to a direction of the centrifugal force produced in said orbital scroll member, a bearing means for rotatably securing the balance weight to said orbital scroll member, whereby the balancing weight means is rotatably mounted on an outer periphery of the boss of the orbital scroll member so that the balancing weight is rotated synchronously with the crankshaft, and a torque transmitting means for transmitting with no radial motion only the torque of said crankshaft to said balancing weight means such that said balancing weight means rotates in the same direction and at the same speed as the rotation of said crankshaft.

4,522,575

SCROLL MACHINE USING DISCHARGE PRESSURE FOR AXIAL SEALING

James C. Tischer, La Crescent, Minn., and Robert E. Utter, Genoa, Wis., assignors to American Standard Inc., New York, N.Y.

Filed Feb. 21, 1984, Ser. No. 581,849
Int. Cl.³ F04C *18/04, 29/00*
U.S. Cl. 418—55 **12 Claims**

1. A scroll compressor comprising

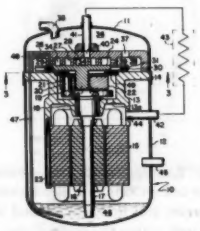
a. two generally parallel scroll plates, one stationary, the other driven in an orbital motion, the facing surface of each having an involute wrap element attached thereon in intermeshed relationship with the wrap element of the other, said wrap elements each defining a radially inner and a radially outer flank surface of similar spiral shape about an axis, contacting flank surfaces of the intermeshed wrap elements defining one or more pockets of fluid compressed by the relative orbital motion of the plates;

b. driving means applied to the orbiting scroll plate, for

causing it to move in fixed angular orbital relationship relative to the stationary scroll plate;

c. a hermetic shell sealingly enclosing the two scroll plates, and including an inlet for admitting suction fluid and an outlet for discharging compressed fluid;

d. a framework extending around the inner surface of the hermetic shell in sealing relationship therewith, said framework being operative to divide the total volume enclosed by the hermetic shell into a suction volume at suction pressure and a discharge volume at discharge pressure, the outwardly facing surface of the orbiting



scroll plate being directly exposed to fluid at both suction and discharge pressure; and

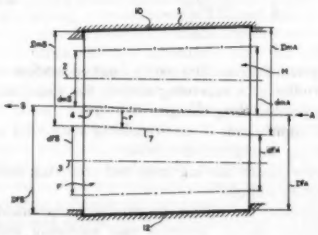
e. an annular thrust balancing seal that extends from the framework to the outwardly facing surface of the orbiting scroll plate, in sealing contact therewith, whereby the relative area of the orbiting scroll plate exposed to fluid at discharge pressure compared to the area exposed to fluid at suction pressure is controlled by the diameter of the thrust balancing seal where it contacts the orbiting scroll plate, to achieve a desired net axial thrust on the orbiting scroll plate toward the stationary scroll plate by balancing the resulting applied forces on the orbiting scroll plate.

4,522,576

VOLUMETRIC MACHINE WITH CONICAL SCREWS

Jean-Jacques Carré, Le Raincy, and Pierre Courbot, Villiers le Bel, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Dec. 19, 1983, Ser. No. 562,653
Claims priority, application France, Dec. 23, 1982, 82 21686
Int. Cl.³ F04C *18/107*
U.S. Cl. 418—194 **8 Claims**



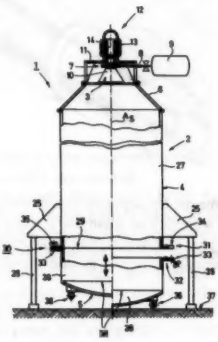
1. A volumetric machine with screws, including at least two rotors with intermeshing helical threads, the rotors being located with their axes parallel in intercommunicating chambers of a housing having inlet and outlet sides adjacent respective opposite axial ends of the rotors, each rotor having a conical outer profile and a pitch diameter which is constant over the axial length of the rotor, the rotors being mounted complementarily in the housing with an axial end of largest outer diameter of one rotor adjacent an axial end of smallest outer diameter of the other rotor, the rotors having their respective pitch diameters tangent along a tangential line parallel to the axes of the rotors.

4,522,577

DEVICE FOR MANUFACTURING POWDER BY DIVIDING A MELT

Rolf Ruthardt, Hanau am Main, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,283
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225868
Int. Cl.³ B28B *1/54*
U.S. Cl. 425—6 **7 Claims**



1. Device for manufacturing powder by dividing a melt into particles and then cooling the particles until they harden, comprising: means for dividing the melt; a container below said means for dividing the melt and comprising substantially a stationary vertical shaft with a vertical axis for cooling the particles; powder outtake means communicating with the shaft; said powder outtake means comprising a lower section of the shaft and having substantially the same cross-section as an upper section, both sections being connected with releasable connecting means and being separatable from each other in a direction perpendicular to the axis of the shaft; said upper section and said lower section when connected together forming vertical falling paths for said particles, all falling paths having substantially identical lengths parallel to said vertical axis, solidified particles collecting at the bottom of said lower section, said lower section being dropped downward and separating from said upper section upon release of said connecting means, said lower section after having dropped downward being movable perpendicular to said vertical axis and away from beneath said upper section for removal of the collected solidified particles.

4,522,578

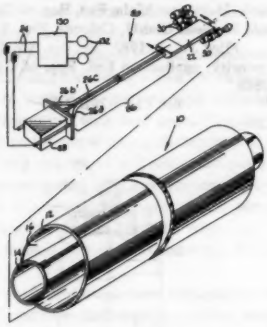
APPARATUS FOR INTRODUCING A FOAMABLE PLASTIC INSULATION INTO THE SPACE DEFINED BY AN INNER CORE PIPE AND AN OUTER CASING PIPE WHILE MAINTAINING THE SPACING OF THE PIPES

William W. Martin, Jr., Denver, and David W. French, Littleton, both of Colo., assignors to J-M Manufacturing Co., Inc., Stockton, Calif.

Filed Dec. 8, 1980, Ser. No. 214,154
Int. Cl.³ B29D *27/04*
U.S. Cl. 425—110 **1 Claim**

1. An apparatus for placing a foamable, curable material in a space defined between a core pipe and an axially aligned casing pipe comprising a reservoir remote from said space for providing the constituents of said material, means for separately conducting said constituents of said material to said space from

said reservoir, and means for disseminating said material within said space; said last mentioned means further including means for intimately mixing said constituents separately conducted thereto substantially simultaneously with said disseminating said material within said space, said means for disseminating



further includes means for supporting said core pipe relative to said casing pipe whereby to maintain a fixed relationship between said core pipe and said casing pipe, said means for supporting being pivotally attached to said means for disseminating.

4,522,579

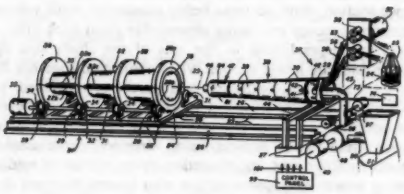
APPARATUS FOR MAKING REINFORCED CONCRETE PRODUCTS

Philip L. Rotondo, 8 Watson Dr., Simsbury, Conn. 06070, and Thomas J. Rotondo, 173 Old Farms Rd., Avon, Conn. 06001

Division of Ser. No. 111,168, Jan. 10, 1980, Pat. No. 4,404,786. This application Apr. 4, 1983, Ser. No. 481,930

Int. Cl.³ B28B *21/32, 21/68;* B21F *11/00*

U.S. Cl. 425—126 R **9 Claims**



9. Apparatus for making a hollow reinforced concrete pole comprising

a concrete and wire placement mechanism,

a hollow elongated substantially cylindrical form,

means for rotating said form about its longitudinal axis,

means for moving said form in an axial direction to and fro relative to said concrete and wire placement mechanism,

said concrete and wire placement mechanism including means for introducing concrete into said rotating form during axial movement thereof whereby layers of concrete are laid down along the length of said rotating form and held against the interior wall of the form by centrifugal force,

and said concrete and wire placement mechanism including means for feeding cutting and ejecting discrete cut lengths of reinforcing wire at least 10 inches in length for embedment in said layers in axially aligned annular arrays during rotation and axial movement of said cylindrical form.

4,522,580

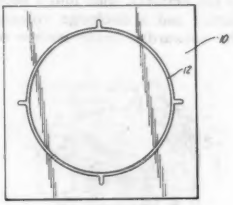
DOUGH ROLLER AND SHAPER DEVICE FOR PIE CRUSTS AND THE LIKE

Clarence E. Poister, 1000 S. Woodlawn, Wichita, Kans. 67218

Filed May 25, 1984, Ser. No. 614,154

Int. Cl.³ A21C *3/02, 5/00, 11/10*

U.S. Cl. 425—193 **9 Claims**



1. A dough roller and shaper device for making pie crust and the like, the device comprising: a roller a dough board having a molded ring therein; and first and second removable dough support discs received within the molded ring, said second disc having a molded ring therein.

4,522,581

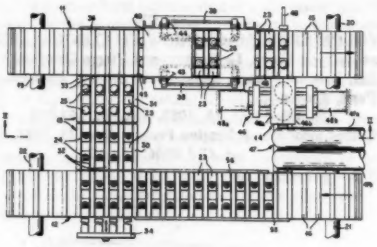
SYSTEM FOR HANDLING PARTLY FINISHED WORKPIECES

Robert D. Schad, Toronto, and Herbert Rees, Willowdale, both of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Sep. 7, 1984, Ser. No. 648,793

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—534 **20 Claims**



1. A system for handling partly finished workpieces periodically arriving at a receiving station for transportation to a finishing station, comprising:

presentation means at said receiving station for making the arriving workpieces available;

conveyor means moving from said receiving station to said finishing station;

a multiplicity of pallets successively entrainable by said conveyor means between said receiving and finishing stations, each of said pallets being provided with holding means for releasably retaining a workpiece available at said presentation means and being further provided with locating means for temporarily consolidating the respective pallet with an operative part of said finishing station to ensure the proper positioning of said workpiece with reference thereto; and

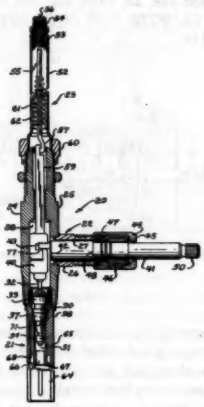
unloading means disposed along the path of said conveyor means for removing the finished workpieces from said pallets.

4,522,582

FUEL CONTROL SYSTEM FOR BURNERS

Richard D. Curtis, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jun. 22, 1984, Ser. No. 623,833
Int. Cl.³ F23D 11/38
U.S. Cl. 431—123 12 Claims



1. In a fuel burning apparatus having a fuel tank, fuel burning means for burning fuel supplied by the tank, fuel conduit means for supplying fuel from the tank to the fuel burning means, the fuel conduit means having a first end provided with a fuel inlet opening positioned within the tank and a second end provided with a fuel outlet orifice for supplying fuel to the fuel burning means, a cleaning rod movable within the fuel conduit means and having an end which is movable within the fuel outlet orifice of the fuel conduit means, and a valve in the fuel conduit means movable between a closed position in which fuel flow through the fuel conduit means is prevented and an open position in which fuel flow through the conduit means is permitted, the improvement comprising:

(a) a control shaft rotatably mounted on the fuel conduit means and extending generally perpendicularly to the cleaning rod,

(b) an eccentric pin mounted on the control shaft eccentrically with respect to the axis of rotation of the control shaft,

(c) an eccentric follower member connected to the cleaning rod and having a shoulder which is engageable with the eccentric pin and a curved surface opposite said shoulder,

(d) a valve block movably mounted within the fuel conduit means and being engageable with the eccentric pin as the eccentric pin rotates with the control shaft, the valve block being engageable with the valve for moving the valve from the closed position to the open position, the eccentric pin being rotatable between:

(i) a first position in which the eccentric pin engages the curved surface but does not engage said shoulder of the eccentric follower and said end of the cleaning rod is positioned within the fuel outlet orifice and the valve is closed,

(ii) a second position in which the eccentric pin engages the curved surface but does not engage said shoulder of the eccentric follower and said end of the cleaning rod is positioned within the fuel outlet orifice and in which the eccentric pin engages the valve block and maintains the valve block in position to open the valve, and

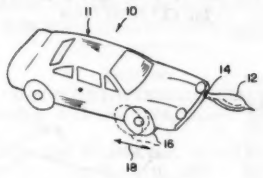
(iii) a third position in which the eccentric pin engages said shoulder of the eccentric follower and said end of the cleaning rod is at least partially withdrawn from the fuel outlet orifice and in which the eccentric pin engages the valve block and maintains the valve block in position to open the valve.

4,522,583

CIGARETTE LIGHTER

Gary S. Kraser, 44 Narwood Rd., Massapequa, N.Y. 11758

Filed May 31, 1984, Ser. No. 615,941
Int. Cl.³ F23Q 2/32
U.S. Cl. 431—125 12 Claims



1. A gas fueled pocket cigarette lighter in the form of a miniature automobile, comprising:

(a) a hollow miniature automobile body having an opening therein for the cigarette lighter flame to issue therefrom;

(b) a cigarette lighter mechanism housed entirely within said hollow miniature automobile body including a fuel tank, a gas nozzle connected to said fuel tank and positioned at the flame opening of the miniature automobile body, a gas valve for admitting gas to said nozzle from said fuel tank and for throttling the same and an ignition system for generating a spark at the nozzle to ignite the fuel exiting therefrom; and

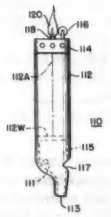
(c) means forming part of said miniature automobile body for activating said ignition system for generating a spark and for operating said gas valve to permit fuel to exit from said nozzle.

4,522,584

LIGHTER COMBINED WITH INSTRUMENT

Serge Crespy, P.O. Box 383, Collingwood, Ontario, Canada L9Y 3Z7

Division of Ser. No. 372,694, Apr. 28, 1982, abandoned. This application Jun. 30, 1983, Ser. No. 509,606
Int. Cl.³ F23Q 2/32
U.S. Cl. 431—253 2 Claims



1. An article comprising:

(a) a pocket-sized plastic housing, having upper and lower parts

(b) a cigarette lighter included in the upper part of said housing and operable by lighter fluid from a reservoir in said cigarette lighter, and

(c) an instrument included in said lower part of said housing, said instrument separated from said cigarette lighter by a wall and having an input hole for receiving an input, walls defining a transforming cavity for transforming said input received by way of said input hole, and output hole for allowing an output to pass out said transforming cavity,

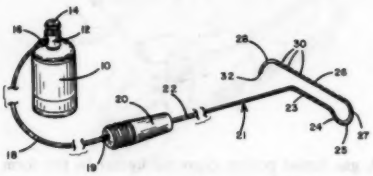
and wherein said instrument is a breath operated whistle, said input hole is adapted to receive a breath input, said transforming cavity transforms a breath input into a sound output, and said output hole outputs the sound output, and wherein said housing forms said walls.

4,522,585

FIREPLACE STARTER

Steven J. Martin, 7221 Clinton Ave. South, Richfield, Minn. 55423

Filed May 11, 1984, Ser. No. 609,351
Int. Cl.³ F23D *13/04*
U.S. Cl. 431—344 **7 Claims**



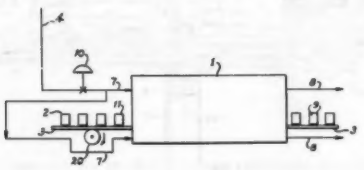
7. Portable apparatus for igniting a fire in a fireplace or the like, the feature consisting essentially of a single length of shape-retaining tubing, the single length of tubing being characterized by being contoured so as to form a first portion of elongated character equipped with a heat insulating handle, a second portion forming a leg means, a third portion forming a burner length which is oriented substantially transversely to the first portion and has a series of openings therein for escape of combustible gas therefrom, and a fourth portion forming a leg portion at the terminal end of the tubing, the distal end of the tubing most remote from its connection to the hose being closed to form a gas tight seal.

4,522,586

THERMAL CONDITIONING OF MATERIAL IN CONTAINERS

Frank C. Price, 13812 Sandhurst Pl., Santa Ana, Calif. 92705

Filed Nov. 29, 1983, Ser. No. 556,141
Int. Cl.³ F27B *9/28*
U.S. Cl. 432—11 **1 Claim**



1. A method of thawing frozen blood plasma within the plasma containers, the object being to thaw the plasma rapidly without a given maximum temperature in any portion of the thawed plasma during the process being exceeded, the containers of plasma being given cyclic motion rotated or shaken while in contact with a heat delivering medium comprising:

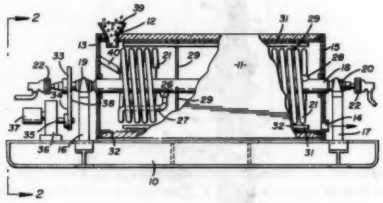
continuously flowing of containers through a contacting chamber, continuously flowing concurrently with the containers the heating medium, contacting within the chamber the medium with the outer surfaces of the containers, setting the inlet temperature of the medium, setting the rate of flow of containers, setting the mass flow rate of medium, gradually dropping the heat exchange along the length of the chamber between the material and the medium gradually thawing the plasma and gradually reducing the temperature level of the medium along the chamber length, maintaining throughout the chamber the container innerwall temperatures below ten degrees centigrade.

4,522,587

ROTATING MELTER

John H. Miller, Youngstown, Ohio, assignor to Hy-Way Heat Systems, Inc., Youngstown, Ohio

Filed Jan. 23, 1984, Ser. No. 573,287
Int. Cl.³ F27B *7/10, 14/00;* E01C *19/45*
U.S. Cl. 432—114 **6 Claims**



1. In an apparatus for simultaneously conveying, agitating and melting pieces of solidified coal tar or like material of a known size, an elongated material receiving tank, a hollow rotatable shaft extending horizontally in said tank, a helical coil within said tank forming a heat exchanger and spiral conveyor and connected with said rotatable shaft for rotation of said coil with said shaft in coaxial relation thereto, said helical coil having the convolutions thereof spaced slightly with respect to one another a distance less than the known size of said pieces of material, means in said tank adjacent an inlet opening therein for directing said pieces of material into one end of said helical coil, said tank having an outlet in said tank adjacent the other end of said helical coil and continuously extending means positioned horizontally in said tank and connected with said shaft for rotation with said shaft, said means being spaced radially of said helical coil and adjacent at least one surface of said tank whereby pices of said material smaller than the space between the convolutions of said coil are moved in an annular path in said tank, means for introducing hot oil into said hollow rotatable shaft and receiving the same therefrom and means in said hollow rotatable shaft for directing said hot oil into, through and out of said helical coil and means for rotating said hollow, rotatable shaft on its longitudinal axis.

4,522,588

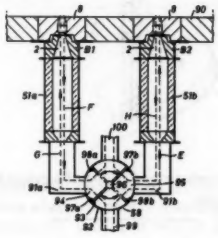
HEAT REGENERATOR

Julian B. Todd, 72 Trafalgar Rd., Moseley, Birmingham, and Roger J. Webb, 108 Purnells Way, Knowle, Solihull, West Midlands, both of England

Filed Oct. 12, 1983, Ser. No. 541,173
Claims priority, application United Kingdom, Oct. 12, 1982, 8229066
Int. Cl.³ F27D *17/00;* F24H *1/00;* F23D *11/44*
U.S. Cl. 432—181 **10 Claims**

1. Regenerative heating apparatus for heating an enclosure defined by a wall which has two ports arranged so that while one port is receiving heating gas to heat the enclosure, the other port is discharging the gas as waste gas after heating the enclosure, the apparatus comprising a pair of regenerators arranged so that in use while one is being heated by waste gas the other is preheating air for the combustion of fuel and so that one regenerator communicates with one port while the other regenerator communicates with the other port, each regenerator being provided at one end with a burner for communicating with the one end of the regenerator and with the respective port, each burner having an outlet communicating with a respective port and an inlet to receive fuel for combustion with preheated air supplied by the regenerator to provide

heating gas for the enclosure and each burner serving in one mode as a means for supplying the heating gas to the enclosure and in a reverse mode as a flue for discharging waste gas to the regenerator, means for detachably securing the burner to the wall of the enclosure in a position enabling the burner to communicate with its respective port, each regenerator having the other end connected to a single reversing valve operable to



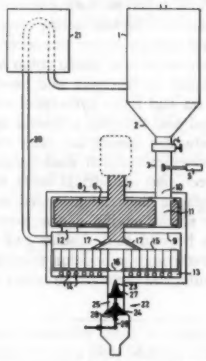
connect one of the pair of the regenerators to an outlet for the discharge of the waste gas while simultaneously connecting the other regenerator to an inlet for receiving air for preheating in the other regenerator, the reversing valve being reversible to connect the one regenerator to the inlet and to connect the other regenerator to the outlet, and means for detachably securing the reversing valve to both of the regenerators.

4,522,589

APPARATUS FOR DISCHARGING LIQUID-COVERED PARTICLES FROM A REACTION CHAMBER AND SUBSEQUENT DRYING OF SAID PARTICLES

Ulf R. Larson, Harabergsgatan 14, S-341 00 Ljungby, and Max-Günther Schmidt, Nygårdsvägen 9, S-260 91 Förslöv, both of Sweden

Filed Dec. 8, 1983, Ser. No. 559,352
Claims priority, application Sweden, Aug. 31, 1983, 8304713
Int. Cl.³ F27D *3/00*
U.S. Cl. 432—239 **9 Claims**



1. Apparatus for discharging moistened, sedimented particles from a reaction chamber and subsequent drying of said discharged particles, preferably metal particles which are produced in the upper portion of a reaction chamber partially filled with a liquid medium, by means of liquid-atomization or gas atomization of a stream of molten metal, whereby the produced metal particles are collected at the bottom of the lower portion of said reaction chamber, comprising

a discharge means arranged at the bottom of said reaction chamber, said discharge means being arranged for an automatic operation and being connected to a sensing member at the bottom of said reaction chamber to sense the absence or presence of sedimented particles in said bottom in such a way that the discharging operation is automatically discontinued at a predeterminable minimum quantity of collected particles and

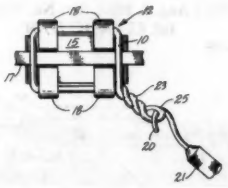
an outlet means closed to the atmosphere and connected to said discharge means, said outlet means being provided with a heated surface and a movable motor-driven means arranged to transport said liquid-coated particles from said discharge means over said heated surface, said discharge means and outlet means being arranged to prevent said particles from coming into contact with ambient air.

4,522,590

RING FOR ORTHODONTIC BRACKET

Erwin C. Pletcher, P.O. Box 3054, Rancho Sante Fe, Calif. 92067

Filed Feb. 17, 1984, Ser. No. 581,302
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—15 **13 Claims**



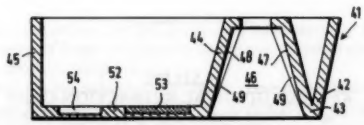
1. A ring for use with an orthodontic bracket with tie wings, comprising an endless loop of stainless-steel wire dimensioned to fit over the bracket tie wings, the wire being sufficiently soft to enable permanent-deformation twisting of a portion of the loop to reduce the length of the ring and thereby to tighten the ring against the bracket behind the tie wings, and to provide a twisted tail as an anchor for an auxiliary appliance.

4,522,591

ARTICULATOR FOR HOLDING DENTAL MODELS

Frank D. Braun, Düsseldorf; Walter Witt, Cologne, and Stanislav Putra, Solingen, all of Fed. Rep. of Germany, assignors to IPCO Corporation, White Plains, N.Y.

PCT No. PCT/EP82/00168, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983, PCT Pub. No. WO83/00431, PCT Pub. Date Feb. 17, 1983
PCT Filed Aug. 7, 1982, Ser. No. 483,556
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131689
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—60 **6 Claims**



1. In a base mold for the manufacture of a dental working model for working on dentures, the base mold having a hollow chamber adapted to receive the dental models, the chamber having a pair of internal walls and ribs on both internal walls, these ribs serving to form retention marks, with the hollow chamber becoming wider from the bottom to the top, and the base mold having a back wall spaced apart from the hollow chamber, the improvement comprising:

a substantially parabolic horizontal plate affixed to the base mold between the back wall thereof and the internal wall next adjacent to said back wall;

the base mold having a lower edge, and said horizontal plate being displaced upward relative to the lower edge of the base mold, and having a lower surface, thereby defining a receptacle bounded in part by said back wall, said internal wall next adjacent to the back wall, and the lower surface of the horizontal plate; and

a permanent magnet inserted in the lower surface of said horizontal plate,

so as to attract and retain the base mold to a magnetic plate mounted in a mounting shoe or the like, when the mounting shoe is disposed in said receptacle.

4,522,592

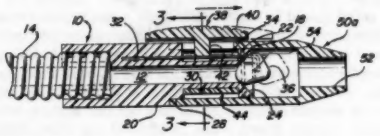
VALVE STRUCTURE FOR AN ORAL EVACUATOR SYSTEM

W. Grant Johnson, 1642 Mockingbird Pl., Orange, Calif. 92667

Filed Aug. 1, 1983, Ser. No. 518,925

Int. Cl.³ A61C *17/04*

U.S. Cl. 433—95 **11 Claims**



1. In an oral evacuator system, a valve structure to be coupled to a vacuum source/waste disposal device of the system by way of a flexible conduit, said valve structure comprising:

an elongated body unit having a central passageway extending therethrough, said body unit having an upstream end with a valve seat around said passageway, a downstream end and a centrally-located mechanism area essentially isolated from said upstream end;

coupling means at said downstream end of said body unit for coupling said central passageway to the flexible conduit;

valve means disposed adjacent said valve face for opening and closing said central passageway;

actuating means isolated from the upstream end, including means slidably and sealably seated in a valve actuating passageway located between the central and upstream portions, said slidable means connected to said valve means for actuating said valve means; and

said actuating means further comprising means for positively placing said valve means in either an open or a closed position.

4,522,593

KNITTED GINGIVAL RETRACTION CORD

Dan E. Fischer, 10444 Dimple Dale Rd., Sandy, Utah 84092

Filed Jul. 7, 1983, Ser. No. 511,779

Int. Cl.³ A61C *5/14*

U.S. Cl. 433—136 **23 Claims**

1. A gingival retraction cord comprising at least one strand formed into a plurality of interlocking loops so as to form a knitted retraction cord for use in retracting gingival tissue preparatory to making an impression of a tooth that has been prepared for fitting of an artificial crown, said cord being knitted sufficiently loosely such that it is elastic in its longitudinal dimension so as to be able to be stretched, and resilient in its transverse dimension so as to be able to be compressed and

conformed to the contour and shape of a gingival sulcus when being packed therein.

4,522,594

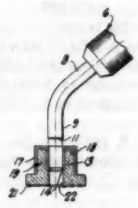
LIGHT SHIELD FOR A DENTAL HANDPIECE

Marvin M. Stark, Los Altos Hills; Kenneth B. Soelberg, Menlo Park, and Roger B. Pelzner, San Mateo, all of Calif., assignors to Marvin M. Stark Research Foundation, San Jose, Calif.

Filed Jan. 21, 1983, Ser. No. 459,818

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—141 **1 Claim**



1. A light shield for a dental handpiece having a tubular end terminating in a squared-off tip and having means for conducting light through said handpiece and to said end to discharge therefrom, comprising an annular shield collar having an inner cylindrical wall adapted to slip over said handpiece end, an annular end flange on said inner cylindrical wall adapted to abut said tubular end and defining a central opening in line with said light conducting means, an outer cylindrical wall connected to said inner cylindrical wall flange to define an annular space between said cylindrical walls, and an annular shield of spongy opaque material mounted in said annular space, said annular shield having a disc portion extending radially and axially beyond said tubular end and having a central opening therethrough in position to conduct said light coming fom said tubular end through the center of said annular shield.

4,522,595

DENTAL TOOL FOR CLEANING TEETH INTERPROXIMALLY

Leroy Selvidge, 1108 Mimosa Dr., Oxford, Miss.

Filed May 27, 1983, Ser. No. 498,702

Int. Cl.³ A61C *3/00*

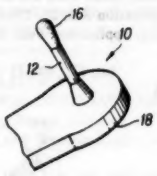
U.S. Cl. 433—142 **9 Claims**

1. A dental tool for the cleaning of the subgingival interproximal concave surfaces of teeth comprising:

an elongate cylindrical shank having a longitudinal axis and a narrow end; and

a resilient and deformable tip located at the narrow end of

said shank and larger than said shank, said tip being integrally formed and sized to be deformably insertable and rotatable interproximally, said tip also having a pear-shaped cross section when viewed in a plane containing the axis of said shank with the larger end outermost and



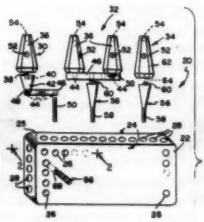
having a maximum diameter of between 0.5 mm and 2.0 mm whereby after deformably inserting said pear-shaped tip interproximally said tip is rubbed along the concave surfaces to clean these surfaces of plaque and to polish these surfaces.

4,522,596

MODULAR IMPLANT ASSEMBLY

Larry R. Ashkinazy, 200 Central Park South, New York, N.Y. 10019

Filed Jan. 20, 1984, Ser. No. 572,435
Int. Cl.³ A61C *8/00*
U.S. Cl. 433—173 **22 Claims**



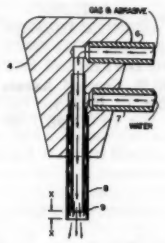
1. An implant assembly using a combination of modular components comprising a base module adapted for endosteal and subperiosteal implantation to a bone structure at selected sites, said module having a pair of opposed side faces defining a matrix of apertures extending transversely through the module and peripheral edge surfaces including a plurality of sockets extending normally along at least one of said edge surfaces, said apertures and said sockets having attachments means for engaging a component means, said component means being randomly registrable with either of said apertures or sockets and adapted to stabilize the module with respect to the bone structure and to support a prosthesis.

4,522,597

EQUIPMENT AND METHOD FOR DELIVERING AN ABRASIVE-LADEN GAS STREAM

Ben J. Gallant, Portland, Tex., assignor to Cooper LaserSonics, Inc., Santa Clara, Calif.

Continuation of Ser. No. 197,886, Oct. 17, 1980, Pat. No. 4,412,402, which is a continuation of Ser. No. 65,228, Aug. 9, 1979, Pat. No. 4,316,472, which is a continuation-in-part of Ser. No. 14,435, Feb. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 928,907, Jul. 28, 1978, Pat. No. 4,174,571. This application Sep. 6, 1983, Ser. No. 529,739
The portion of the term of this patent subsequent to Nov. 1, 2000, has been disclaimed.
Int. Cl.³ A61C *3/06*; B24C *5/04*
U.S. Cl. 433—216 **21 Claims**



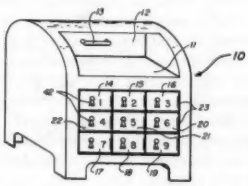
1. A method for cleaning teeth comprising directing a stream of particle-laden gas toward the surface of a tooth to be cleaned, concurrently directing a stream of liquid toward said surface, the particles comprising a material soluble in said liquid, and the liquid and gas streams being directed to provide for the presence of both liquid and particles within the same target area of the tooth surface to be cleaned.

4,522,598

EDUCATIONAL TOY MAILBOX

Daniel P. Coyne, and Alberta P. Coyne, both of P.O. Box 258, Anderson, Calif. 96007

Filed May 18, 1984, Ser. No. 612,064
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—259 **3 Claims**



1. An educational toy for developing understanding of the relationship of larger and smaller numbers to physical size and to one another, comprising:

a body having individual numbered compartments therein, each said individual numbered compartment having an access door bearing a number assigned to said individual numbered compartment and a deposit hole identified with said number assigned to said individual numbered compartment with which it communicates, each said deposit hole being of an unique shape and size so that an object of correct shape and size fits into one said deposit hole but not into any other said deposit hole, the size of each said deposit hole corresponding to said number assigned to said individual numbered compartment with which it

communicates so that said deposit holes associated with successively lower-numbered said individual numbered compartments are successively smaller, while said deposit holes associated with successively higher-numbered said individual numbered compartments are successively larger, and

a set of deposit objects, each having a number and an unique shape and size corresponding to said number and said unique shape and size of one of said deposit holes so that each said deposit object fits into only one said deposit hole identified with a matching number,

thereby developing children's understanding of the relationship of larger and smaller numbers to physical size and to one another.

4,522,599

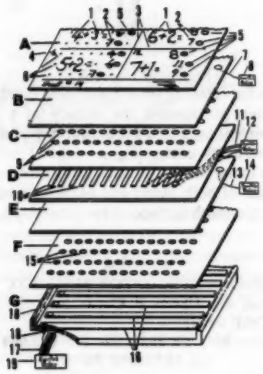
COMPUTER ASSISTED INSTRUCTIONAL AND TESTING APPARATUS WITH SWITCH CLOSURE AT TWO DIFFERENT DEPTHS

J. Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Oct. 11, 1983, Ser. No. 540,636

Int. Cl.³ G09B *7/06*

U.S. Cl. 434—339 **6 Claims**



1. An instructional apparatus that gives feedback to the user as to his or her correct or incorrect responses by the use of: a computer that is programmable and is linked to input and output sources; an instructional sheet that contains response areas that represent possible correct answer choices to multiple choice, true-false, or cross matching questions, said response areas being located at some of the coordinates of a grid pattern, said instructional sheet overlying a number of electroconductive and nonconductive components that are held in a holding frame and are organized so that when downward pressure is exerted at any response area, which may be at any of the coordinates of the grid pattern, that two electric circuits are closed by this downward pressure, one of the closed circuits indicating which of the longitudinal coordinates in the grid was energized, and the other circuit that was closed indicating which perpendicular coordinate of the grid was energized; said information as to the two circuits that are closed being sent to the computer by wires, relays, and other appropriate means, said computer having been previously programmed with said grid coordinates to identify some of the coordinates of where the longitudinal and perpendicular coordinates intersect as being correct response areas, and designating the remaining grid coordinates as incorrect response areas, said computer receiving and evaluating this input from the teaching apparatus, and having means sending information immediately back to the user as to correct and incorrect responses.

4,522,600

WIND PROPULSION FOR ALL TYPES OF VEHICLES AND STATIONARY MACHINES

Bernhard Jöst, Traminerweg 4, D-6800 Mannheim 31, Fed. Rep. of Germany

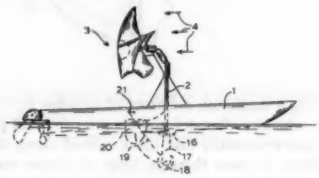
Continuation of Ser. No. 395,050, filed as PCT DE 81/00175 Oct. 10, 1981, published as WO 82/01398, Apr. 29, 1982, § 102(e), dated Jun. 15, 1982, abandoned.

This application Jul. 26, 1984, Ser. No. 634,656

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039387

Int. Cl.³ B63H *13/00*

U.S. Cl. 440—8 **11 Claims**



1. A wind propulsion device for driving a transmission shaft connected through intermediate members with devices for force transmission, comprising:

(a) a wind impeller including a plurality of wind wings which are concavely curved against the air stream;

(b) a semisphere convexly curved against the air stream and axially disposed with respect to said impeller to which said wind wings are connected, said semisphere guides the air stream at the center of the impeller to the tips of the wings for efficient wind utilization and is formed of sheet metal; and

(c) an axle having mounted thereon for rotation a tube to which said semisphere and wings are connected, said tube driving said transmission shaft.

4,522,601

BOAT

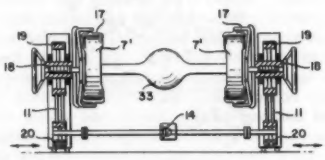
Byung E. Yoo, #616-5, Daemyung-dong, Nam-ku, Daegu-si, Rep. of Korea

Filed Sep. 24, 1982, Ser. No. 423,155

Claims priority, application Rep. of Korea, Jun. 30, 1982, 82-2909[U]

Int. Cl.³ B63H *19/00*

U.S. Cl. 440—11 **4 Claims**



1. An automobile ferry comprising:

a zone for accommodating an automobile having two driven wheels and two sterrable wheels;

each of said driven wheels being at least partially surrounded by and operatively engaged with a clamp; said clamp being provided with a control handle and key means for tightening of said clamp about said driven wheels;

said clamp being operatively connected to a first pulley, said first pulley being operatively connected to a second pulley by means of an endless belt means, and said second pulley being operationally connected to a first shaft means;

a bevel gear assembly means being operatively connected to said first shaft means and to a propeller shaft which is

provided with a propeller for propelling said ferry through the water;

a cradle means for embracing said steerable wheels, including a pivotal link means operatively associated therewith;

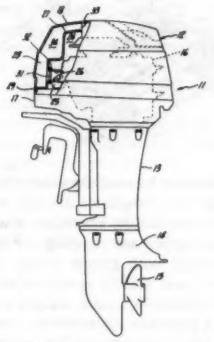
a bell crank operatively associated with said pivotal link said bell crank being further operatively associated with a second link means for selectively moving a lever means associated therewith, said lever means being further operatively associated with and capable of pivoting a rudder means for steering said ferry.

4,522,602

INTAKE SYSTEM FOR OUTBOARD MOTORS

Masaki Okazaki, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 20, 1983, Ser. No. 486,668
Claims priority, application Japan, May 7, 1982, 57-76154
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—77 **8 Claims**



1. In an induction system for an outboard motor or the like comprising an engine having an induction system air intake and a protective outer cowling substantially enclosing said engine and consisting of a main cowling portion covering and surrounding the engine and a lower tray, said main cowling portion having a front face, a pair of side faces and a top face all integrally connected, the improvement comprising a partition of substantially U shape having a portion extending substantially across the rear side of the front face of said main cowling portion of said protective outer cowling and having the legs of said substantially U-shaped partition extending along the forwardmost portion of the side faces of said outer cowling and having a peripheral flange formed around at least a portion of the periphery of said partition and engaged with said main cowling portion to define an air chamber between said engine and an operator of said outboard motor or the like and to reinforce said main cowling portion, air inlet means into said air chamber comprising a pair of inlets defined each by a respective side of said partition in areas where said partition has no flange engaged with said main cowling portion and wherein said partition is spaced from the adjacent portions of said outer cowling portion, and an air outlet communicating said air chamber with said induction system air intake.

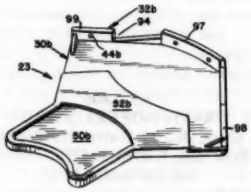
4,522,603

WATER SKI BINDINGS

Keith H. Doyle, 10758 133rd Ave., East, Puyallup, Wash. 98371

Filed Oct. 14, 1983, Ser. No. 542,202
Int. Cl.³ A63C *5/00*
U.S. Cl. 441—70 **18 Claims**

1. As an article of manufacture, a one piece, integral water ski binding for receiving a portion of a skier's foot and comprising a flexible binding rubber portion integrally joined to framework portion, said binding rubber portion being flattenable to an unflexed condition when unattached to a ski or other part, said framework portion being harder than said binding rubber portion, said framework portion comprising one or more segments each having a quadrilateral cross section which extends transversely of said binding rubber portion when said binding rubber portion is flattened to said unflexed condition, said



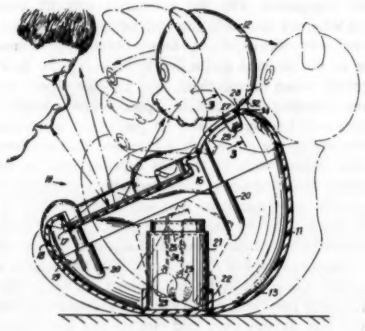
framework portion having fastener receiving holes formed only through said framework portion and not through said binding rubber portion, said holes being arranged for receiving fasteners for fastening said water ski binding to a water ski or a part mounted on a water ski, said framework portion extending outwardly from said binding rubber portion to overlie said ski when said binding rubber portion is flexed to form the foot receiving cavity.

4,522,604

ROCKABLE TOY WITH A REFLECTING MIRROR

Albert Stubbmann, Franklin Lakes, N.J., assignor to Shelcore, Inc., S. Plainfield, N.J.

Filed Aug. 29, 1983, Ser. No. 526,957
Int. Cl.³ A63H *33/22*
U.S. Cl. 446—219 **16 Claims**



1. A rockable toy, comprising a main body having a bottom surface that is curved in all directions, the toy having a center of gravity situated substantially on a central axis of said body and within the confines of said curved bottom surface so that, when the toy is displaced in any direction from its stable position in which said central axis is substantially vertical, it will oscillate about its stable position until such oscillatory motion is damped sufficiently for the toy to remain in its stable position; and at least one mirror mounted on said main body for displacement therewith to present to the observer of the toy different and constantly changing reflected images during the oscillatory motion of the toy, said main body has substantially the configuration of a body of a figure in a sitting position; and further comprising a head mounted on said body outside the periphery of said mirror and in the line of sight of the observer via its reflection in said mirror in the intended position of use

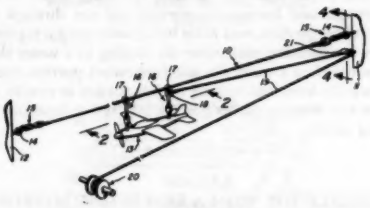
of the toy relative to the observer, so that the reflection of the head in the mirror will appear in front of an ever-changing background during the oscillatory motion of the toy.

4,522,605

GRAVITY-OPERATED TOY

Lawrence A. Guay, Jr., 29 Walter St., Portland, Me. 04103

Filed Aug. 1, 1983, Ser. No. 519,024
Int. Cl.[3] A63H *21/02*
U.S. Cl. 446—228 1 Claim



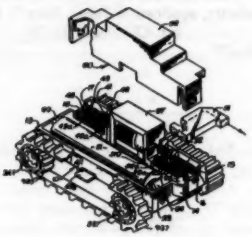
1. A gravity-operated toy comprising spaced first and second guide line supports having respectively fastener elements, the fastener on the first support being higher than the fastener upon the second support, a guide line respectively having fasteners on the respective opposite ends thereof and respectively engageable with the respective support fastener elements whereby the guide line will be supported in an inclined manner, a toy-like object and means for slidably connecting the same to the inclined guide line to slide rapidly downwardly thereover when unrestrained, said toy-like object connecting means including longitudinally-spaced forward and rear connectors each having a closed eye piece with a threaded shank for traversing the guide line, a threaded stud anchored in the toy-like object with its threads exposed and an oppositely internally threaded sleeve for detachably and adjustably securing the threaded anchored stud and toy-like object to the eye piece shank whereby the toy-like object can be detached for replacement by another object and adjusted to level the object with respect to the line for best operation thereupon, a control line guide connected to the first support just below the toy-like object guide line support and a freely holdable reel assembly, a control line slidable over said control line guide support and connected at one end to the toy-like object and at the other end connected to and wound in quantity upon said freely holdable reel, said reel having end walls of large diameter beyond the wound line on the reel so that the control line cannot readily escape thereover and axially-aligned dowel handle ends rigidly fixed to said reel and respectively extending from the respective opposite sides thereof, said reel assembly when held by the hands of the operator by the dowel handle ends extending through yoked thumb and fore-fingers enable the reel to unwind freely in response to the gravity pull of the toy-like object down the inclined guide line between its supports but upon thumbs and fingers upon the dowel ends may be restrained in its downward movement and when the handle ends be fully grasped being operable to rewind the pulled out control line from the reel and return the toy-like object to the desired elevated position upon its guide line.

4,522,606

SELF-POWERED MINIATURE TOY VEHICLE WITH TREADS AND WITH UNUSUAL FOUR-WHEEL-DRIVE CLIMBING CAPABILITY

Adolph E. Goldfarb, Westlake Village, Calif.; Delmar K. Everitt, 4310 Tosca Rd., Woodland Hills, Calif. 91356, and Norman J. Burger, 10164 Leu Ave., Pacoima, Calif. 91331, assignors to Delmar K. Everitt, Woodland Hills and Norman J. Burger, Pacoima, both of, Calif.

Continuation-in-part of Ser. No. 438,510, Nov. 2, 1982, , and Ser. No. 417,554, Sep. 13, 1982, , which is a continuation-in-part of Ser. No. 233,495, Feb. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 121,645, Feb. 14, 1980, Pat. No. 4,306,375. This application Feb. 4, 1983, Ser. No. 463,986
Int. Cl.[3] A63H *17/14*
U.S. Cl. 446—433 16 Claims



1. A plural-speed miniature treaded toy vehicle for use with electrical battery means that comprise a dry-cell battery, and for both generally conventional-toy operation at at least one speed on a generally flat surface and climbing-toy operation at at least one reduced speed with greater torque on a steep and/or irregular surface; said vehicle having, when such battery means are in use therewith, major weight components positioned to provide a generally symmetrical, compact, balanced and relatively low arrangement that enhances such climbing-toy operation; said vehicle comprising:

a chassis that has a front end and a rear end;

rotary driving means mounted to the chassis for rolling rotation about at least one laterally extending front axis and at least one laterally extending rear axis;

endless-belt tread means supported from and driven by the rotary driving means, and disposed to engage such surfaces to propel the vehicle relative such surfaces;

means mounted to the chassis to releasably support such electrical battery means;

an electric motor mounted to the chassis, and having a driveshaft;

means on the chassis for electrically connecting such battery means, when supported in the supporting means, to the motor, so that such battery means power the motor driveshaft;

a speed-reduction mechanism mounted to the chassis and connecting the motor driveshaft to said wheel means to transmit rotation from the driveshaft to the rotary driving means with a mechanical advantage, said speed-reduction mechanism comprising, rotatably mounted to each of said front and rear ends of the chassis,

a worm adapted to be powered by the motor shaft,

a worm gear adapted to engage and be driven by the worm, and

an axle positioned at a corresponding one of the front and rear axes; and

means associated with the speed-reduction mechanism for selecting among a plurality of values of the mechanical advantage, including at least one value providing such generally conventional-toy operation for generally flat surfaces and at least one other value providing such climb-

ing-toy operation with greater torque for steep and/or irregular surfaces;

the rotary driving means comprising front rotary driving means mounted to the axle that is mounted to the front end of the chassis, and rear rotary driving means mounted to the axle that is mounted to the rear end of the chassis;

the front and rear rotary driving means being adapted to be powered respectively by the worm gears that are mounted to the front and rear ends of the chassis; and

the tread means comprising an endless-belt tread that is looped over, suspended between, and driven by both of the front and rear rotary driving means;

at least major portions of the motor and of such battery means, when such battery means are supported in the supporting means, being at approximately the same height as the rotary driving means, to particularly enhance such climbing-toy operation at said other value on such steep and/or irregular surfaces; and

the speed-reduction mechanism comprises, rotatably mounted to the housing at each of said front and rear ends,

a driver gear adapted and disposed to be powered from the motor shaft, and

two spur-gear-and-worm clusters adapted and disposed to be powered by the driver gear, the said worm that is adapted to be powered by the motor shaft being provided selectably by either one of the two spur-gear-and-worm clusters;

the worm gear is shiftable relative to the spur-gear-and-worm clusters, to engage and be driven by either of the two spur-gear-and-worm clusters;

the axle is adapted and disposed to be driven by the worm gear; and

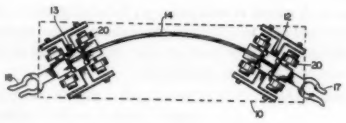
the rotary driving means are adapted and disposed to be driven by the axle.

4,522,607

TOY RAILROAD VEHICLE WITH ALIGNMENT BIAS

Eugene J. Kilroy, Palos Verdes Estates; James E. Morse, Lawndale; Thomas H. Grimm, Manhattan Beach, and Nicholas DeAnda, Redondo Beach, all of Calif., assignors to Mattel, Inc., Racine, Wis.

Filed Jan. 12, 1984, Ser. No. 570,132
Int. Cl.[3] A63H *19/28*
U.S. Cl. 446—447 **5 Claims**



5. A toy railroad vehicle comprising:

a substantially flat elongated chassis defining a greater length in the intended direction of travel and a pair of apertures adjacent each end along said greater length;

a first truck assembly having a first center support, a first pair of spaced apart axles coupled to said first center support, and a first quartet of wheels arranged in opposed pairs upon said first pair of axels;

a second truck assembly having a second center support, a second pair of spaced apart axels coupled to said second center support, and a second quartet of wheels arranged in opposed pairs upon said second pair of axels;

a first spring platform defining a first plurality of raised members extending away from said platform and forming therebetween a first center space;

a second spring platform defining a second plurality of raised members extending away from said platform and forming therebetween a second center space;

a first shaft member extending through said first aperture having a first end coupled to said first spring platform and a second end coupled to said first center support of said first truck assembly;

a second shaft member extending through said second aperture having a first end coupled to said second spring platform and a second end coupled to said second center support of said second truck assembly; and

an elongated beam spring having a substantially flat cross section and having a first end passing through said first center space of said first spring platform and a second end passing through said second center space of said second spring platform,

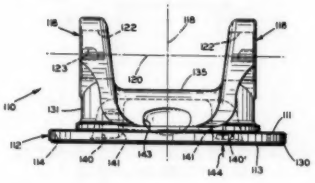
said elongated beam spring exerting a resisting force which opposes rotation of said first and second truck assemblies away from common alignment in the intended direction of travel.

4,522,608

FLANGE YOKE

Robert G. Joyner, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 9, 1982, Ser. No. 405,978
Int. Cl.[3] F16D *3/26*
U.S. Cl. 464—134 **6 Claims**



1. A flange yoke comprising:

an annular flange having front and back faces, an axis of rotation, and a bolt circle about said axis of rotation on which is spaced a plurality of bolt holes;

two lugs extending axially from said front face and symmetrically positioned about said axis, each of said lugs having radially inner and outer surfaces, and each of said lugs defining a bearing cross hole extending therethrough transversely to said axis between the respective radially inner and outer surfaces of each of said lugs, said bearing cross holes being aligned;

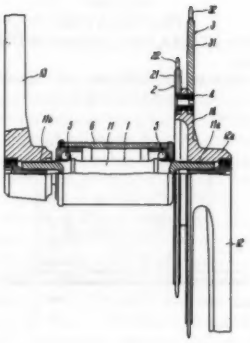
said back face having a centrally located relief for receiving a mounting nut, said back face further having a pilot ring about said axis and surrounding said relief for positioning a companion flange;

a balance pad positioned within said relief and generally underneath one of said lugs, the axially outermost surface of said balance pad being recessed axially inwardly into said relief with respect to the surface of said back face adjacent said relief;

a balance hole positioned in said balance pad generally underneath one of said lugs, entirely radially inwardly of said radially outer surface of said one lug, at least partially radially inwardly of said radially inner surface of said one lug, and radially inwardly from said pilot ring.

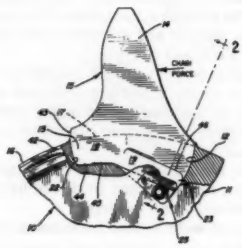
4,522,609
Patent Not Issued For This Number

4,522,610
GEAR CRANK APPARATUS FOR A BICYCLE
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed May 23, 1983, Ser. No. 497,051
Claims priority, application Japan, Jun. 1, 1982, 57-94396; Jul. 2, 1982, 57-115837; Oct. 9, 1982, 57-177828
Int. Cl.³ F16H *55/30*
U.S. Cl. 474—141 **7 Claims**



1. A gear crank apparatus for a bicycle comprising a crank shaft, a pair of crank arms, and at least one chain gear, said chain gear being provided with a gear body and a number of teeth provided circumferentially at the outer periphery of said gear body and having a not-round ellipse-like shape so that pitch diameters of a number of said teeth are different circumferentially of said gear body, said crank arms being operated in rotation to rotate said chain gear, so that the gear diameter is adapted to change at a rate to correspond to a change of torque produced by a cyclist's leg and transmitted to said driving chain during rotary operation of said crank arms, said chain gear being arranged with respect to said crank arms so that said crank arms are disposed rearwardly relative to a drive-rotation direction with respect to a maximum gear diameter portion of said chain gear, such that when the torque produced by the cyclist's leg is maximum during the rotatable operation of said crank arms, the gear diameter of said chain gear becomes substantially minimum and when the torque produced by the cyclist's leg is minimum, the gear diameter of said chain gear becomes substantially maximum.

4,522,611
SPROCKET ASSEMBLY WITH REPLACEABLE TEETH
David M. Hiatt, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.
Filed Dec. 27, 1982, Ser. No. 453,799
Int. Cl.³ F16H *55/12*
U.S. Cl. 474—162 **17 Claims**



1. A sprocket assembly with replaceable teeth for engaging a chain comprising a generally cylindrical sprocket body having a cylindrical periphery and adapted to be axially mounted on a rotatable shaft and having a plurality of equally spaced tooth receiving pockets in the cylindrical periphery thereof,

each of said pockets extending generally circumferentially of said body and having a toe portion open to said cylindrical periphery and heel portion communicating with said toe portion and spaced rearwardly thereof relative to the direction of chain force applied to said sprocket assembly, said heel portion being partially defined by an outer wall separating said heel portion from said cylindrical periphery, said body being equipped with axially extending passages, one on each side of said heel portion,

a tooth removably mounted in each pocket having a toe part and a heel part for mounting respectively in each of said pocket toe and heel portions and having a chain engaging contour radially outward of said parts, and

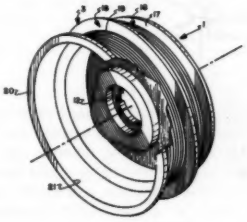
wedge lock means in said passages for engagement with said tooth heel part to urge said tooth toe part into engagement with said socket toe portion whereby the chain force tends to seat said tooth in said pocket.

4,522,612
BALANCED PULLEY CONSTRUCTION
Benjamin F. Frazer, Dothan, Ala., assignor to Dyneer Corporation, West Port, Conn.
Filed Apr. 20, 1983, Ser. No. 486,673
Int. Cl.³ F16H *55/49*
U.S. Cl. 474—168 **8 Claims**

1. An improved balanced pulley construction including:

(a) a pulley cup having a planar end wall formed with a central opening and an annular wall formed with belt receiving grooves therein extending axially outwardly from said end wall;

(b) a one-piece stamped steel balancing washer having a generally flat annular configuration formed with a central hole and having an integrally formed projection extending radially outwardly therefrom, said central hole having a diameter equal to or greater than the diameter of the central opening of the planar end wall; and



(c) means for permanently bonding the balancing washer on and flush against the end wall of the pulley cup without the use of additional fasteners and spaced radially inwardly from the annular wall with the central hole of the washer being concentric with the central opening of the end wall, and with the washer projection being positioned to counterbalance an unbalanced condition in the annular wall of the pulley cup, and with said washer being adapted to be engaged by a fastening nut which mounts the pulley cup on a shaft which projects through the central opening of the cup wall and central hole of the washer.

4,522,613

V-BELT

Torao Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,653

Claims priority, application Japan, Jun. 2, 1982, 57-94579

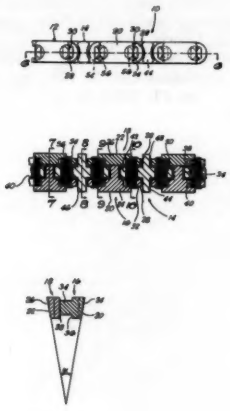
Int. Cl.³ F16G *5/18*

U.S. Cl. 474—245 **12 Claims**

1. A V-belt comprising

first links each including a right link member, a left link member, a transverse spacer therebetween and rigidly fixed, inclined transmission faces on two opposite sides thereof, each said link member having two first ends with a first connecting hole through each said first end;

second links each including two second ends with a second connecting hole through each said second end and a block between said two second ends having rigidly fixed, inclined transmission faces on two opposite sides thereof, said inclined transmission faces of said first and second links having equal transverse spacing and equal angles of inclination; and



pins extending through said first and second connecting holes and alternately connecting said first and second links.

4,522,614

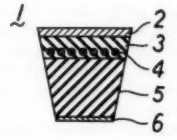
AUTOMATIC TENSION MAINTAINING TRANSMISSION BELT

Hiroshi Matsuoka, Izume, and Yutaka Furukawa, Sennan, both of Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 242,928, Mar. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 958,410, Nov. 7, 1978, abandoned. This application Aug. 23, 1984, Ser. No. 621,439

Int. Cl.³ F16G *1/00, 5/00, 9/00;* B29D *3/00*

U.S. Cl. 474—260 **10 Claims**

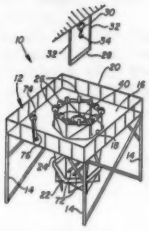


1. An automatic tension transmission belt having polyester fiber cords embedded therein which shrink at a temperature greater than 80° C., when the belt is operating between two pulleys for the transmission of force therebetween, the frictional heat generated by any slippage during said operation of the belt causes the fiber cords to shrink at operating temperature, thereby increasing the belt tension and eliminating said slippage.

4,522,615
METHOD AND APPARATUS FOR MANUFACTURING AN AGRICULTURAL BAG

Eddie H. Bailen, Omaha; David H. Rasmussen, Arlington, and William C. Johnson, Omaha, all of Nebr., assignors to AG-Bag Corporation, Astoria, Oreg.

Continuation of Ser. No. 342,842, Jan. 26, 1982, Pat. No. 4,424,051. This application Oct. 24, 1983, Ser. No. 544,496
Int. Cl.³ B31B *23/02*
U.S. Cl. 493—37 12 Claims



1. A method of manufacturing a two-ply agricultural storage bag, comprising the steps of:

providing a relatively small diameter tubular plastic guide ring;

providing a relatively large diameter tubular plastic material advancing ring, including tubular plastic material advancing means;

positioning the guide ring coaxially and in a predetermined spaced apart relationship with respect to the advancing ring;

rotatably supporting a first roll of tubular plastic material on the side of the guide ring opposite from the advancing ring;

extending the leading end of the tubular plastic material from the first roll through the guide ring and around the advancing ring so that the tubular plastic material from the first roll is turned inside out at its point of engagement with the advancing ring;

rotatably supporting a second roll of tubular plastic material on the side of the advancing ring opposite from the guide ring;

extending the leading end of the tubular plastic material from the second roll around the outside of the advancing ring and around the outside of the tubular plastic material from the first roll positioned therearound;

thereafter actuating the advancing means of the advancing ring to simultaneously advance both the tubular plastic material from the first roll and the tubular plastic material from the second roll thereby forming a two-ply tubular plastic structure;

measuring the length of the two-ply tubular plastic structure as it is formed by the foregoing steps;

gathering the advancing two-ply structure into a series of folds;

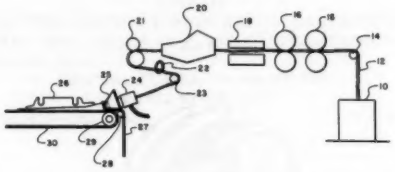
interrupting the advance of the two-ply plastic structure after a predetermined length thereof has been measured; and

cutting the two-ply plastic structure in a plane extending substantially perpendicularly to the axis thereof and thereby forming a two-ply agricultural storage bag having the predetermined length.

4,522,616
METHOD AND APPARATUS FOR FORMING CIGARETTE FILTER RODS

Rebecca A. Hyde, Charlotte; Kenneth R. Krimminger, Oakboro, and Robert E. Swander, Charlotte, all of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,708
Int. Cl.³ A24C *5/50*
U.S. Cl. 493—44 9 Claims

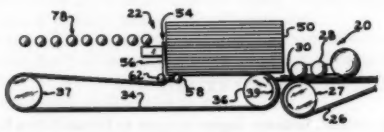


1. In an apparatus suitable for a range extension process of manufacturing filter elements from opened and deregistered crimped continuous filament tow, wherein said tow is conducted from a mechanical forwarding means through an aspirating jet into a compacting means immediately adjacent said jet and wherein means are provided for dissipating aspirating fluid, the improvement comprising: (a) a tow controlling means positioned intermediate said mechanical filament forwarding means and said aspirating jet, said tow controlling means controlling width and direction and imparting at least some drag to said opened and deregistered tow and; and (b) a perforated funnel member positioned intermediate said aspirating jet and said compacting means, said perforated funnel member having sufficient volume to allow said tow to accumulate in a substantially tension free condition prior to being drawn into said compacting means whereby pressure drop and weight variations in resultant cigarette filter elements are reduced at extended points in range.

4,522,617
CONVERSION BELT AND STOP PLATE ASSEMBLY FOR UPSTACKING CORRUGATED BOX MACHINERY

Donald E. Mowry, Norwalk, Ohio, assignor to Don Mowry Flexo Parts, Inc., Norwalk, Ohio

Filed Aug. 12, 1983, Ser. No. 522,387
Int. Cl.³ B31B *1/98;* B65H *31/08*
U.S. Cl. 493—126 3 Claims



1. In a corrugated box machine having an inking apparatus, a gluing apparatus, and a folding apparatus, including delivery belts, the invention comprising an improved delivery and stacking apparatus, a plurality of drive belts for receiving boxes as they are discharged from the folding apparatus, said drive belts being mounted for movement around leading rollers adjacent the folding apparatus and rearward rollers spaced from said leading rollers, said drive belts having a horizontal upper surface which is raised above said delivery belts whereby the boxes contact said drive belts on the upper halves of said leading rollers, said leading rollers moving the boxes upwardly to a stacked relationship atop said horizontal upper surface of said drive belts and a stop plate positioned contiguous said horizontal upper surface at a location between said leading rollers and said rearward rollers, said stop plate extending across said horizontal upper surface to stop and align the

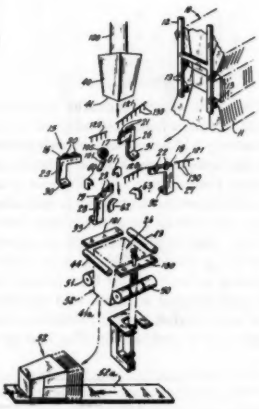
leading edge of an entering box with the stacked boxes, said stop plate having a front face which slants rearwardly relative to said horizontal upper surface thereby forming an obtuse angle with said horizontal upper surface of said drive belts to cause the leading edges of the stacked boxes to lose contact with said front surface of said stop plate as the stacked boxes move upwardly.

4,522,618

MECHANISM FOR ASSEMBLING TAPERED, NESTED CONTAINERS

Charles G. Stannard, E. Granby, Conn., assignor to Sprinter Systems Incorporated, East Windsor, Conn.

Filed Apr. 8, 1982, Ser. No. 366,569
Int. Cl.³ B31B *1/44, 1/62, 1/98*
U.S. Cl. 493—143 **2 Claims**



1. A machine for making a tapered nestable container from a blank, said container having front and back walls and side walls with side panels extending from each side of the front and back walls;

said machine comprising a tapered mandrel male member, the inner dimension of which matches the inner dimension of the container to be formed from the blank, and having a bottom section matching the bottom wall of the blank;

a die; support and guide arranged above the die in horizontal position with respect thereto; said mandrel having a vertical movement into the die and said die having a horizontal position;

said blank being positioned on said support and guide members prior to movement of said mandrel into said die;

means being provided for applying adhesive to outer portions of sections of the blank, said mandrel moving downwardly into the die driving the blank through the die after said adhesive has been applied; and

said means for applying adhesive comprising movable carrier members having a plurality of pins extending therefrom; said pins being arranged along the contour of the blank adjacent the edge of the blank and adjacent the inner surfaces of the outer edges of the panels which are to be bolded on the outside of the additional panels of the blank;

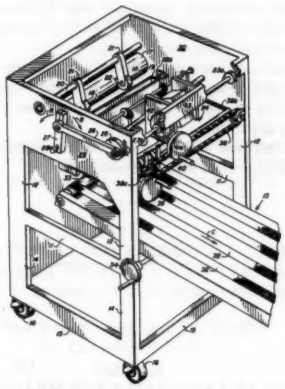
said pins extending on each side of the carton blank and a glue pot adjacent said pins; said pins being movable from a position where their ends are inserted into said glue pot to a position where their ends extend adjacent the surface of the blank, and being moveable from the glue pot to the blank when the blank is in position to receive glue from the pins and being movable back before the next blank is placed in position.

4,522,619

TIMING ADJUSTMENT MECHANISM FOR CONTINUOUS FORM STATIONERY FOLDING MACHINE

Earnest B. Bunch, Jr., 7016 W. Astor Rd., Peoria, Ariz. 85345

Filed Jan. 28, 1980, Ser. No. 115,705
Int. Cl.³ B65H *45/20*
U.S. Cl. 493—415 **1 Claim**



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said apparatus including,

a frame,

an oscillating chute mounted on said frame for alternately distributing said successive lines of weakening in said paper in substantially opposite directions,

rollers carried on said frame for dispensing said continuous strip of paper into said oscillating chute,

folding means carried on said frame and operatively associated with said oscillating chute for urging said paper distributed by said chute into a folded condition, said folding means including,

spirals shaped and dimensioned to receive and carry away from said oscillating chute creased edges of paper distributed by said chute, said spirals being independently adjustable prior to the operation of said apparatus,

beaters for periodically tamping said paper distributed by said chute, said beaters assisting in the folding and positioning of said paper and being independently adjustable prior to the operation of said apparatus,

said spirals and beaters moving in synchronous relationship with said chute during the operation of said apparatus,

a support surface for receiving paper dispensed by said spirals and beaters,

paper stops positioned above said support surface, each of said paper stops having at least one upstanding face for stopping the lateral travel of creased edges of paper distributed by said chute,

gear train means for transmitting motive power to said rollers, oscillating chute, and folding means such that generally synchronized movement thereinbetween is maintained, a portion of said gear train means actuating said chute and said folding means, said portion actuating said chute and folding means without actuating said rollers,

power means to drive said gear train means,

means for simultaneously adjusting said oscillating chute and said folding means in relation to said rollers while maintaining said generally synchronous movement between said chute and folding means, said adjustment means including,

(a) at least one drive shaft positioned along said gear train means and transmitting motive power to said portion of

said gear train means actuating said oscillating chute and said folding means, said drive shaft having a first segment and a second segment, and

(b) a differential unit positioned along and interconnecting said first shaft segment and said second shaft segment for rotating said first shaft with respect to said second shaft so that said synchronous movement of said oscillating chute and said folding means may be adjusted in relation to said rollers when

(i) said oscillating chute and said folding means are in motion during operation of said continuous form stationery folding apparatus, and

(ii) said oscillating chute and folding means are idle prior to said power means being actuated to provide motive power to operate said continuous form stationery folding apparatus,

said first and second shafts each carrying at least one component of said differential unit.

4,522,620

METHOD AND APPARATUS FOR MEASURING THE QUANTITY OF SOLID MATERIAL IN A CENTRIFUGE CYLINDER

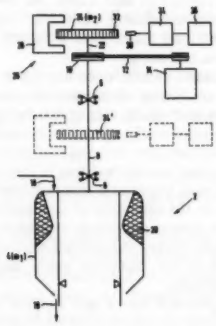
Peter Leister, Waldbronn, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 549,999

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241624

Int. Cl.³ B04B *13/00*

U.S. Cl. 494—10 **13 Claims**



1. A method for measuring the quantity of a solid material load in the cylinder of a centrifuge, particularly for use in reprocessing nuclear fuel solutions, said centrifuge having a drive shaft which comprises

(a) providing a mass supplementing the mass of said centrifuge and connecting to the drive shaft of said centrifuge,

(b) temporarily imparting natural torsional vibrations to said centrifuge, drive shaft, and supplemental mass,

said torsional vibrations being produced by an electromagnetic field surrounding a cage armature rotation with said drive shaft, the frequency of said vibrations depending upon the quantity of the load,

(c) measuring the frequency of said natural vibrations, and

(d) converting the frequency into quantity units.

4,522,621

ARTIFICIAL INSEMINATION APPARATUS

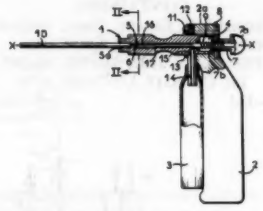
Bertrand Cassou, Saint Symphorien des Bruyeres, 61300 l'Aigle, France, assignor to Bertrand Cassou; Robert Cassou and Maurice Cassou, all of l'Aigle, France

Filed Jan. 14, 1983, Ser. No. 457,923

Claims priority, application France, Jan. 26, 1982, 82 01173

Int. Cl.³ A61M *37/02;* **A61D** *7/02*

U.S. Cl. 604—140 **17 Claims**



1. Artificial insemination apparatus comprising a body defining a conduit having a front end adapted to receive an end of a tube containing a dose of semen, an ejection rod mounted slidingly in said conduit and manually displaceable from a rear portion thereof remote from said front end of said conduit, and air supply means communicating with said conduit for supplying air under pressure to expel the semen from said tube, said conduit being generally circular in cross-section; and said ejection rod being formed with a non-circulator cross-section; thereby defining at least one air flow passage extending longitudinally in said conduit adjacent said ejection rod from said front end of said conduit to said communication with said air supply means so as to conduct air from said air supply means to said tube.

4,522,622

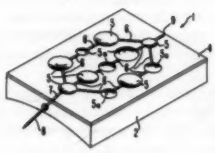
MULTIPLE FLUID PULSE DISPENSER

John R. Peery, Palo Alto, and James B. Eckenhoff, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Dec. 23, 1982, Ser. No. 452,522

Int. Cl.³ B65D *35/22*

U.S. Cl. 604—191 **10 Claims**



1. A multiple fluid pulse dispenser for introducing predetermined amounts of a biologically active agent into an animal comprising, in combination:

(a) a first member having a plurality of spaced apart concavities formed on one surface,

(b) a second member comprising a plurality of spaced apart permanently invertible blisters, said first and second members being sealed together with the blisters overlaying the

concavities so as to provide a plurality of fluid receiving reservoirs, the blister configuration being selected such that, on inversion, the inverted blister will displace substantially all of the fluid contents of its reservoir, and

(c) fluid communication means connecting said reservoirs to a common outlet means through which the fluid contents of said reservoirs may be dispensed upon inversion of a blister into its associated concavity.

4,522,623

SUCTION BOTTLE FOR MEDICINAL PURPOSES

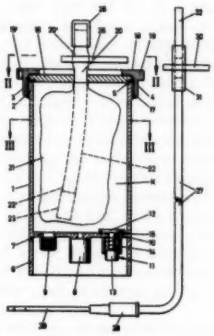
Friedrich G. Laüterjüng, Schallstr. 6, 5000 Köln 41, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,558

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150500

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—319 **23 Claims**



1. In a suction bottle for medical purposes having a cover, with a valve connection nipple for evacuating an inner chamber of the bottle surrounding a disposable bag arranged within the inner chamber, the volume of the bag being increasable by vacuum in the inner chamber outside of the bag adapted to suck material into the bag, a drainage tube connected with the interior of the bag adapted for receiving the sucked material, and an upper edge of the bag suspended at the cover of the suction bottle, the improvement wherein

said bottle having a bottom wall portion and wall means for supporting the bottle via a part of said wall means such that said bottom wall portion is spaced higher than said part

the valve connection nipple is arranged at a said bottom wall portion of the bottle,

means comprising a closure member for air-tight clamping of the drainage tube, and

a drainage tube connection nipple is provided with said closure member, said drainage tube connection nipple with said drainage tube constitutes sole means of communication into said bag,

said edge of the bag plus cover plus said drainage tube connection nipple are integrally combined into a disposable unit non-releasably connected air-tightly to each other.

4,522,624

INCONTINENT PAD

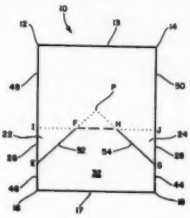
Martha E. Bolick, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 1, 1983, Ser. No. 518,981

Int. Cl.³ A61F *13/16*

U.S. Cl. 604—385 R **23 Claims**

1. An incontinent pad adapted to be worn about the hips and to cover the perineal area of a wearer, said pad comprising a layer of absorbent material overlaying a moisture impermeable layer, having a generally rectangular shape, and having two symmetrical generally straight cuts through both layers, each cut extending from a beginning at an opposite edge toward a generally centrally located point and terminating at a fold line generally perpendicular to the edges from which the cuts originate and located within the central third of the pad between the end points of the cuts, measured along the edges from which the cuts originate; with the angle of intersection of the cut line with the fold line extension ranging from 15° to 75°.



4,522,625

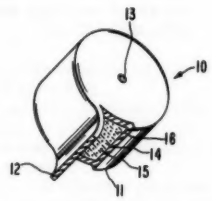
DRUG DISPENSER COMPRISING WALL FORMED OF SEMIPERMEABLE MEMBER AND ENTERIC MEMBER

David Edgren, El Granada, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Sep. 29, 1982, Ser. No. 427,870

Int. Cl.³ A61K *9/22, 9/32*

U.S. Cl. 604—892 **2 Claims**



1. An oral osmotic therapeutic dispenser for the controlled dispensing of a drug formulation in the gastrointestinal tract, which dispenser comprises:

(a) a shaped osmotically functioning wall formed of a composition consisting essentially of (i) a selectively semipermeable material permeable to the passage of fluid, substantially impermeable to the passage of drug, which maintains its physical and chemical integrity in the presence of gastric fluid and intestinal fluid, and is a member selected from the group consisting of cellulose acylate, cellulose diacylate, cellulose triacylate, cellulose acetate, cellulose diacetate, and cellulose triacetate, blended with (ii) from 0.5 wt. % to 40 wt.% of an enteric material that is substantially insoluble in gastric fluid, leaves the shaped wall in response to intestinal fluid, thereby increasing the passage of fluid through the shaped wall in the intestine while maintaining the osmotic functionality of said shaped wall wherein the wall remains substantially impermeable to the passage of the drug, the wall surrounding and forming:

(b) a compartment containing from 0.05 mg to 3 g of a drug formulation that is soluble in external fluid that enters the compartment and exhibits an osmotic pressure gradient across the wall against an external fluid when the dispenser is in the gastrointestinal tract;

(c) an osmotic passageway in the wall communicating with the compartment and the exterior of the osmotic dispenser for dispensing drug formulation from the dispenser; and,

(d) wherein, when the osmotic dispenser is in the gastrointestinal tract, fluid passes through the wall of the osmotic dispenser into the compartment to continuously dissolve the drug formulation to create an osmotic pressure within the device whereby the formulation is osmotically delivered through the passageway at a controlled rate over a prolonged period of time to the gastrointestinal tract.

4,522,626
PROCESS FOR TREATING HIGH-SULFUR CAKING COALS TO INACTIVATE THE SULFUR AND ELIMINATE CAKING TENDENCIES THEREOF

Wilton F. Espenscheid, DeSoto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 163,081, Jun. 26, 1980, abandoned, which is a continuation of Ser. No. 001,665, Jan. 8, 1979, abandoned. This application Jul. 21, 1981, Ser. No. 265,291

Int. Cl.³ C10L *9/02, 9/12*

U.S. Cl. 44—1 R **21 Claims**

1. A process of treating high-sulfur, caking coals for deactivation of the sulfur, substantial elimination of the caking tendencies and incorporation of a catalyst therewith which comprises reducing the particle size of the high-sulfur, caking coal, and (a) subjecting the resultant coal to a slurry of lime at a lime/coal ratio between about 0.2 and 20%, (b) then subjecting the resulting mixture to air or oxygen treatment, at a temperature between about 100° and 300° C., at a pressure between about 100 and 1000 psig, and for a period of time between about 15 minutes and 2 hours, said catalyst being the resultant reaction product or products produced by steps (a) and (b).

10. A process of treating high-sulfur, caking coals for deactivation of the sulfur, substantial elimination of the caking tendencies and incorporation of a gasification or hydrogasification catalyst therewith which comprises the steps of:

(1) grinding or crushing the high-sulfur, caking coal to less than about ¼", (a) mixing the resultant coal in a mixer with about 0.2 to 3.0 molar sodium hydroxide (aqueous) up to about 50% by volume of coal in the mixture, transferring the resultant mixture under pressure to a stirred reactor in the presence of air or oxygen at a temperature between about 100° and 300° C., at a pressure between about 100 and 1000 psig for a period of time between about 15 minutes and 2 hours, and

(2) filtering and washing of the coal obtained by step (1), mixing the resultant washed coal with a slurry of lime in water in a second reactor at a temperature between about 150° and 300° C. at a lime/coal ratio between about 0.02 and 0.20 wt/wt, and drying the end product, said catalyst being the resultant reaction product or products produced by steps 1(a) and 2.

11. A process according to claim **10** wherein the resultant wash of step (2) is recycled to said mixer of step (1) and a slip-stream of same is causticized with lime to remove sulfates and restore pH of said wash.

18. The low-sulfur, non-caking coal produced by the process of claim **10**.

4,522,627
PROCESS FOR PRODUCING OIL-CONTAINING, MICROSPHERICAL CARBONACEOUS PARTICLES

Shimpei Gomi, Tokyo; Tomomitsu Takeuchi, Yokohama; Itaru Matsuo, Matsudo; Toshio Tsutsui; Takao Nakagawa, both of Ichikawa, and Shigeru Miwa, Ichihara, all of Japan, assignors to Fuji Standard Research Kabushiki Kaisha, Tokyo, Japan

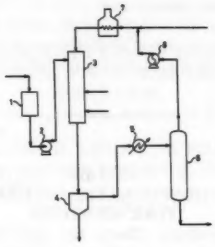
Filed Dec. 6, 1982, Ser. No. 447,289

Claims priority, application Japan, Dec. 28, 1981, 56-209986

Int. Cl.³ C10L *9/00, 9/10, 5/00, 5/16*

U.S. Cl. 44—1 R **7 Claims**

1. A process for producing pitch spheres substantially free of moisture having a softening point of at least 80° C., solid flow rate of at least 200 sec/15 μg, and an average particle diameter from 30–200 μm, which comprises heating and melting at 120°–430° C. a material pitch selected from the group consisting of petroleum and coal pitches having fixed carbon contents of 40–75 wt % and softening points of 80°–220° C., mixing and atomizing the molten pitch in a stream of an inert gas at a pressure from atomospheric to 10 kg/cm² and at a temperature lower than that of the molten pitch, cooling and solidifying said atomized pitch by further lowering the temperature of said mixture of said atomized pitch and inert gas by spraying a cooling medium into the mixture in a quantity such that it evaporates and its latent heat of vaporization is used to obtain said spheres substantially free of moisture, and adding a fine powder having a fluidity-improving effect on said pitch



spheres in a quantity of from 0.05 to 1% based on the weight of the pitch spheres in at least one of said pitch sphere forming steps and separating step.

4,522,628
METHOD FOR REMOVING ASH MINERAL MATTER OF COAL WITH LIQUID CARBON DIOXIDE AND WATER

Joseph G. Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 331,054, Dec. 16, 1981, abandoned. This application Jul. 19, 1983, Ser. No. 515,098

Int. Cl.³ C10L *9/02*

U.S. Cl. 44—1 SR **10 Claims**

1. A method for removing the ash mineral matter content of run-of-mine coal comprising:

(a) grinding the run-of-mine coal to a particle size to form a suitable slurry;

(b) mixing the coal particles with water and liquid carbon dioxide in a vessel;

(c) determining the solubility parameter of said coal and maintaining the mixture of coal particles, liquid carbon dioxide, and water in the mixing vessel in a swirling, fluidized state at a pressure, temperature, and for a residence time sufficient to separate ash mineral matter from the coal particles and form an ash free coal/mineral matter slurry; and

(d) separating the ash free coal particles from the ash free coal/mineral matter slurry by froth floatation and recovering the coal particles substantially free of ash mineral matter.

5. A method for removing the ash mineral matter content of run-of-mine coal and transporting the low ash content coal from the ash demineralizing point to a coal use point comprising:

(a) grinding the run-of-mine coal to a particle size to form a suitable slurry;

(b) mixing the coal particles with water and liquid carbon dioxide in a vessel;

(c) determining the solubility parameter of said coal and maintaining the mixture of coal particles, liquid carbon dioxide, and water in the mixing vessel in a swirling, fluidized state at a pressure, temperature, and for a residence time sufficient to separate ash mineral matter from the coal particles and form an ash free coal/mineral matter slurry;

(d) separating the low ash coal particles from the coal/mineral slurry by froth floatation and recovering the coal particles substantially free of ash mineral matter;

(e) drying said recovered ash free coal particles;

(f) slurrying said dried ash free coal particles with liquid carbon dioxide to form an ash free coal/carbon dioxide slurry;

(g) pumping said slurry through a pipeline to said coal use point;

(h) deslurrying said ash free coal/carbon dioxide slurry at said coal use point to separate said ash free coal and said liquid carbon dioxide; and

(i) recovering said coal-free liquid carbon dioxide and passing said liquid carbon dioxide through a pipeline for admixture with said coal being treated in step (b).

4,522,629

BORATED PHOSPHONATES AS LUBRICANT AND FUEL ADDITIVES

Andrew G. Horodysky, Cherry Hill, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,131
Int. Cl.³ C10L *1/30*
U.S. Cl. 44—53 **26 Claims**

1. A product of reaction made by reacting a hydrocarbyl vicinal diol containing 10 to 30 carbon atoms, a dihydrocarbyl phosphite of the formula

wherein R is a hydrocarbyl group containing 1 to 30 carbon atoms and R^2 is a hydrocarbyl group containing 1 to 6 carbon atoms and a boron compound, the reaction being run at from about 70° C. to about 260° C. using amounts of reactants such that in the final product at least about 5% of the hydroxy groups originally available are borated.

13. A liquid fuel composition comprising a major proportion of a liquid fuel and from about 5 to about 250 pounds per 1000 barrels of said liquid fuel of a reaction product made by reacting a hydrocarbyl vicinal diol containing 10 to 30 carbon atoms, a dihydrocarbyl phosphite of the formula

wherein R is a hydrocarbyl group containing 1 to 30 carbon atoms and R^2 is a hydrocarbyl group containing 1 to 6 carbon atoms and a boron compound, the reaction being run at from about 70° C. to about 260° C. using amounts of reactants such that in the final product at least about 5% of the hydroxy groups originally available are borated.

4,522,630

DIESEL FUEL COMPOSITION

Paul D. Seemuth, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 29, 1984, Ser. No. 594,924
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—53 **5 Claims**

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, and said fuel containing a cetane number increasing amount of a fuel soluble tetrahydro-2,5-furandimethanol dinitrate.

4,522,631

DIESEL FUEL CONTAINING RARE EARTH METAL AND OXYGENATED COMPOUNDS

Antonio M. Mourao, Wappingers Falls, and Clifford H. Faist, Monsey, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,019
Int. Cl.³ C10L *1/08*
U.S. Cl. 44—57 **6 Claims**

1. A diesel fuel comprising a hydrocarbon based diesel fuel composition boiling in the range of about 350° F. (175° C.) to 750° F. (400° C.) and containing a particulate suppressing mixture of between about 0.001 and about 0.1% by weight of a cerium salt of an acid selected from the group consisting of carboxylic acids and cycloalkyl carboxylic acids having from 3 to 25 carbon atoms, and an alkylcarbitol having from about 5 to 16 carbon atoms providing from about 0.0025 to 1.5 wt. % of oxygen in said diesel fuel.

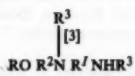
4,522,632

ETHERDIAMINE BORATES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Richard S. Herd, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

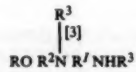
Filed Sep. 23, 1983, Ser. No. 535,133
Int. Cl.³ C10L *1/30*
U.S. Cl. 44—72 **16 Claims**

1. A product of reaction made by reacting a N-hydrocarbyloxyhydrocarbylenediamine of the formula



wherein R is a hydrocarbyl group containing 6 to 30 carbon atoms, R^1 and R^2 are hydrocarbylene groups containing 2 to 3 carbon atoms and R^3 is hydrogen or a C_1 to C_5 hydrcarbyl group with a boron compound, the reaction being carried at from about 90° C. to about 260° C., using a molar ratio of etherdiamine to boron compound of from about 4:1 to about 1:2.

8. A liquid fuel composition comprising a major proportion of a liquid fuel and a minor antioxidant or antifriction amount of a product of reaction made by reacting a N-hydrocarbyloxyhydrocarbylenediamine of the formula



wherein R is a hydrocarbyl group containing 6 to 30 carbon atoms, R^1 and R^2 are hydrocarbylene groups containing 2 to 3 carbon atoms and R^3 is hydrogen or a C_1 to C_5 hydrocarbyl group with a boron compound, the reaction being carried out at from about 90° C. to about 260° C., using a molar ratio of etherdiamine to boron compound of from about 4:1 to about 1:2.

4,522,633

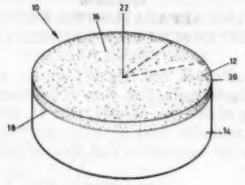
ABRASIVE BODIES

Henry B. Dyer, P.O. Box 67276, Bryanston, Transvaal, South Africa

Filed Aug. 3, 1983, Ser. No. 519,800
Claims priority, application South Africa, Aug. 5, 1982, 82/5661
Int. Cl.³ C23C *11/14*; C04B *35/58*
U.S. Cl. 51—307 **10 Claims**

1. An abrasive body comprising a cubic boron nitride compact having major surfaces on each of opposite sides thereof,

the one surface being bonded to a substrate, and the other surface presenting a cutting edge, the compact comprising a first phase of a polycrystalline mass of intergrown cubic boron



nitride particles and a second bonding phase and the substrate having a coefficient of thermal conductivity at least four times lower than that of the compact.

4,522,634

METHOD AND APPARATUS FOR AUTOMATIC REGULATION OF THE OPERATION OF AN ELECTROSTATIC FILTER

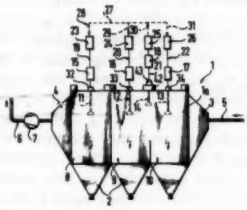
Werner Frank, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Walther & Cie Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,663

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301772

Int. Cl.³ B03C *3/68*

U.S. Cl. 55—2 **15 Claims**



1. A method of regulating the application of electrical potential to a first high-tension electrostatic filter, particularly a filter which is used for the separation of solid particles from a gaseous carrier medium and wherein a first electrode is spaced apart from a second electrode of opposite polarity, comprising the steps of placing into the carrier medium a miniature second electrostatic filter; applying to one electrode of the second filter a potential which at least closely approximates the breakdown potential at which the electric field between the electrodes of the second filter collapses; monitoring the potential which is applied to the second filter; and utilizing the monitored potential as a reference value for the application of potential to one electrode of the first filter so that the potential which is applied to the one electrode of the first filter closely approximates but is below the breakdown potential.

3. Apparatus for separating solid particles from a gaseous carrier medium which is conveyed along a predetermined path, comprising at least one first high-tension electrostatic filter having at least one pair of spaced-apart first and second electrodes of opposite polarity, said electrodes being in contact with the medium in said path; a miniature second electrostatic filter having spaced-apart first and second electrodes whose mutual distance is a fraction of the mutual distance of the electrodes of said first filter and which are located in said path; means for applying to one electrode of said second filter a potential at least closely approximating the breakdown potential at which the electric field of the second filter collapses; and control means for applying to one electrode of said first filter a potential at least closely approximating but remaining below the breakdown potential for the first filter, including means for monitoring the potential which is applied to the one electrode of said second filter.

4,522,635

METHOD AND DEVICE FOR VARYING A D.C. VOLTAGE CONNECTED TO AN ELECTROSTATIC DUST SEPARATOR

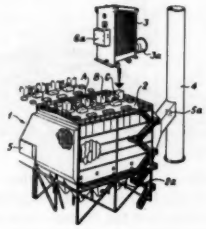
Sigvard Matts, Växjö , Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Oct. 18, 1983, Ser. No. 543,023

Claims priority, application Sweden, Oct. 19, 1982, 8205941; Dec. 16, 1982, 8207201

Int. Cl.³ B03C *3/68*

U.S. Cl. 55—2 **26 Claims**



1. A method for varying a d.c. voltage connected to electrodes in an electrostatic dust separator to render it more effective in return for a low consumption of energy and high collection of dust on one of said electrodes incorporated in the dust separator, wherein the d.c. voltage has a first basic d.c. level, superimposing on said d.c. level a plurality of voltage pulses forming a pulse group, with the consecutive pulses being separated from each other by a time interval, supplying said voltage to the electrodes in the dust separator, wherein said superimposing of pulses is accomplished by generating a plurality of pulses making up a pulse group, and selecting the configuration of the first pulse in said pulse group so as to have an amplitude and a duration and a form such that, when the pulse is supplied to the dust separator, it will not cause flash-over but will produce an increase in the tendency to flash-over of the dust separator, and selecting the configuration of each succeeding pulse in said pulse group so as to have an amplitude and a duration and a form such that, when each of said succeeding pulses is supplied to the dust separator, it will not cause flash-over in spite of the temporary increased tendency to flash-over which is caused by the preceding pulse.

4,522,636

PIPELINE GAS PRESSURE REDUCTION WITH REFRIGERATION GENERATION

Stephen J. Markbreiter, Edison, N.J., and Hans P. Schorr, Douglaston, N.Y., assignors to Kryos Energy Inc., New York and The Brooklyn Union Gas Company, Brooklyn, both of, N.Y.

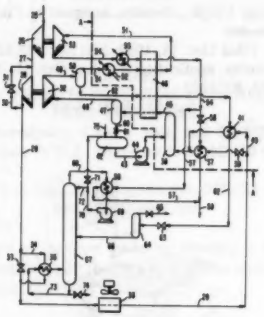
Filed Feb. 8, 1984, Ser. No. 578,074

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—23 **12 Claims**

1. A process for reducing the high pressure of pipeline gas to a predetermined low pressure of a distribution system while generating refrigeration solely with energy derived from the reduction of pressure which comprises compressing said gas in two successive stages to increase the pressure thereof at least about 150 psi, injecting methanol into the thus compressed gas, cooling said compressed gas containing methanol by heat exchange with said gas after expansion as hereinafter set forth, expanding the cooled gas with the performance of work sub-

stantially without liquefaction of said gas, said work being utilized in one of said two stages of compression, separating an aqueous methanol condensate from the expanded gas and subjecting said condensate to distillation for the recovery and reuse of said methanol, said distillation receiving reboiler heat from said compressed gas prior to said cooling thereof, recovering low level refrigeration from the thus dehydrated expanded gas and then further expanding said dehydrated expanded gas with the performance of further work substantially



without liquefaction of said gas, said further work being utilized in the other of said two stages of compression, recovering low level refrigeration from the further expanded gas and then passing said further expanded gas in countercurrent heat exchange relation with said compressed gas to effect cooling thereof as hereinbefore set forth, utilizing said further expanded gas to provide reflux cooling to said distillation, and thereafter discharging said further expanded gas at said predetermined low pressure into said distribution system.

4,522,637

INTEGRATED ADSORPTION SYSTEM FOR THE PURIFICATION OF SEPARATE CRUDE GASES

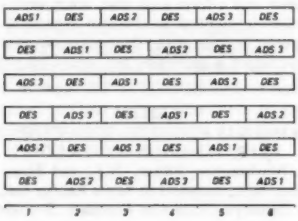
Hans Becker, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,476

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244304

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—25 **12 Claims**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1. In a gas adsorption process for the purification of contaminated crude gas streams in an adsorption facility containing a plurality of cyclically reversible adsorbers wherein each cycle of an adsorber comprises at least one adsorption phase and one desorption phase, the improvement comprising conducting said adsorption of several crude gas streams separately from one another in a single adsorption facility having a number of adsorbers larger by at least one than the number of crude gas streams; and passing the crude gas streams in cyclic alternation through the adsorbers with the provision that each adsorber is passed through a number of adsorption phases equal to the total number of said several crude gas streams wherein each adsorber is cyclically charged with all of said crude gas streams.

4,522,638

METHOD AND APPARATUS FOR REGULATING THE NH_3 CONTENT IN SCRUBBING LIQUID USED IN A GAS SCRUBBING PROCESS

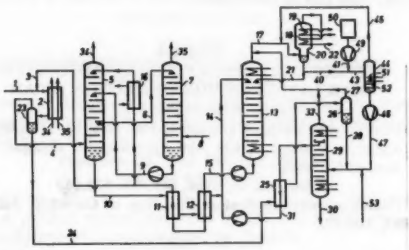
Heinz Karwat, Pullach, Fed. Rep. of Germany, assignor to Linde AG, Hollriegelskreuth, Fed. Rep. of Germany

Continuation of Ser. No. 434,288, Oct. 14, 1984, abandoned. This application May 22, 1984, Ser. No. 612,885

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141772

Int. Cl.³ C02F *1/72*

U.S. Cl. 55—37 **9 Claims**



1. A process for regulating the NH_3 content of an organic liquid which acts as a physical scrubbing agent and is used in a procedure for removing sour gases from gaseous mixtures, said liquid being freed from the absorbed gaseous components after the scrubbing procedure and being reused in the circuit, comprising adding an acid precipitant to the scrubbing agent to precipitate ammonia salts thereform and separating the resultant precipitant from the scrubbing agent, further comprising cooling the scrubbing agent after precipitation to a temperature in the range of about 0° to −95° C., preferably 0° to −40°, said scrubbing agent containing reaction products, ammonia being removed from the scrubbing agent to the extent of leaving a residue of 300–2000 mg/kg, preferably 500–1000 mg/kg, which combines with the scrubbing agent to enchance scrubbing effectiveness.

4,522,639

UNIFIED FILTER AND CONNECTOR HOUSING ASSEMBLY INCORPORATING A DIVERSION VALVE

William K. Ansite, Glendale, and James H. Ryder, Sierra Madre, both of Calif., assignors to Figgie International Inc., Willoughby, Ohio

Filed Apr. 15, 1983, Ser. No. 485,179

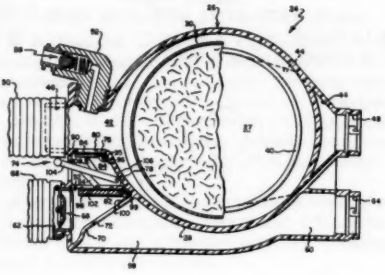
Int. Cl.³ B01D *46/42*

U.S. Cl. 55—314 **9 Claims**

1. A unified filter and connector housing assembly for use with a protective breathing mask assembly of the type utilizing ventilating air for defogging, said filter and connector housing assembly comprising:

first and second housing members secured to each other and capable of receiving a filter canister therebetween in an airtight manner, the first housing member being provided with inlet and outlet breathing gas connector port means and passageway means and so designed that in normal operation breathing gases will flow from a breathing gas supply through the inlet breathing gas connector port means and to the outlet breathing gas connector port means through said breathing gas passageway means and through said filter canister, and said first housing member further being provided with inlet and outlet ventilating

gas connector port means and passageway means and so designed that in normal operation ventilating gases will flow from a ventilating gas supply through the inlet ventilating gas connector port means and to the outlet ventilating gas connector port means through said ventilating gas passageway means and not through said filter canister, said first housing member further being characterized by



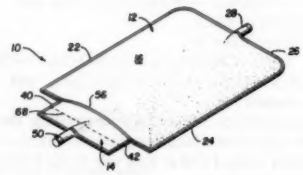
the provision of diversion valve means movable from n mal to emergency positions and capable upon the failure of either the breathing gas supply or the ventilating gas supply and when placed in an emergency position of insuring that most of the gas received at one of said inlets passes through the breathing gas passageway means and the filter canister while diverting a small portion of the gas available to the ventilating gas passageway means.

4,522,640

MEANS FOR CHILLING CARDIOPLEGIC SOLUTIONS

A. Louis Jagoe, III, 9519 E. Stanhope Rd., Kensington, Md. 20895

Filed Apr. 10, 1984, Ser. No. 598,916
Int. Cl.³ F25D *5/00*
U.S. Cl. 62—4 **7 Claims**



1. An integral multi-compartment disposable packaging unit comprising in combination

means designed for transfer of heat between a thermic material and a sterile solution used in surgical procedures including

a first compartment means made from flexible sheet material defining a first compartment adapted to contain a predetermined quantity of such sterile solution,

a second compartment means made from flexible sheet material defining a second compartment encasing a major portion of said first compartment so as to define a sealed space therebetween providing for indirect heat exchange between said compartments,

such sealed space holding a reactive material capable of providing a thermic reaction when combined with an activating reagent, and

means for selectively adding an activating reagent from externally of such packaging into said sealed space for combining with and reacting with such reactive material, such reaction taking place independently of such sterile solution in said first compartment,

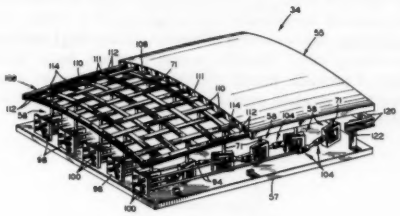
said first compartment having a discharge portion accessible for opening and discharge of such sterile solution without discharging contents of said sealed space defined by said second compartment.

4,522,641

APPARATUS FOR BENDING GLASS SHEETS

Floyd T. Hagedorn, Oregon, and Merwyn L. Koontz, Maumee, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Apr. 27, 1984, Ser. No. 604,461
Int. Cl.³ C03B *23/023*
U.S. Cl. 65—291 **12 Claims**



11. An adjustable form for use in bending a heat-softened glass sheet, comprising a rigid mounting plate, a flexible shaping element in spaced relation to said rigid mounting plate, said shaping element having a resilient body portion which is simultaneously flexible in more than one direction and including a substantially continuous shaping surface, and spaced, flexible stiffening means associated with said resilient body portion, said stiffening means being encapsulated in said resilient body portion, and means for mounting said flexible shaping element on said rigid mounting plate including adjustment means for selectively adjusting the disposition of portions of said flexible shaping element relative to said rigid mounting plate for altering the shape of said flexible shaping element and thus the contour of said shaping surface.

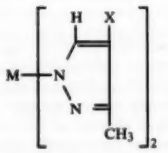
4,522,642

SOIL TREATING METHOD AND COMPOSITION FOR CONSERVING NITROGEN IN SOIL

Kim E. Arndt, Pittsburg; Richard B. Rogers, and Ronald W. McCormick, both of Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1984, Ser. No. 624,428
Int. Cl.³ C05C *13/00*
U.S. Cl. 71—11 **21 Claims**

1. A composition which comprises a reduced nitrogen fertilizer in admixture with from about 0.05 to about 98 percent by weight of a pyrazole compound-metal salt which corresponds to the formula



wherein M represents cobalt, copper, or zinc and X represents hydrogen, bromo, chloro or methyl.

4,522,643

USE OF QUATERNIZED DERIVATIVES OF POLYMERIZED PYRIDINES AND QUINOLINES AS MICROBIOCIDES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 32,044, Apr. 23, 1979, Pat. No. 4,297,484. This application Mar. 12, 1981, Ser. No. 242,858

Int. Cl.[3] A01N *43/40, 43/42*

U.S. Cl. 71—67 9 Claims

1. A process of inhibiting microbiological growth which comprises treating a system with a quaternized derivative of polymerized pyridine or quinoline compounds, which compounds prior to polymerization are selected from the group consisting of pyridine, 2-methyl pyridine, 4-methyl puridine, 4-phenyl pyridine, 4-ethyl pyridine, 2-hydroxypyridine, 2,4-lutidine, quinoline, 2-methyl quinoline and 4-methyl quinoline, the nitrogen atoms of which are quaternized by treating said polymerized compounds with a quaternizing agent selected from the group consisting of methyl iodide, ethyl iodide, propyl iodide, ethyl bromide, benzyl bromide, butyl bromide, dodecyl bromide, benzyl chloride, dodecyl benzyl chloride, ethyl bromoacetate, dimethyl sulfate, tetradecyl bromide, and octyl bromide, at a temperature of at least 100° C.

4,522,644

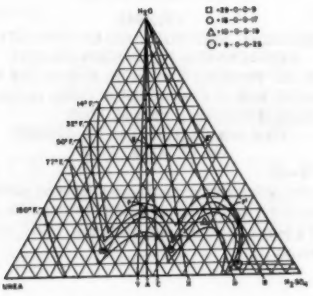
METHOD FOR SELECTIVELY CONTROLLING PLANT SUCKERS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 444,667, Nov. 26, 1982, , Continuation-in-part of Ser. No. 442,296, Nov. 17, 1982,. This application Dec. 27, 1982, Ser. No. 453,282

Int. Cl.[3] A01N *59/00*

U.S. Cl. 71—78 14 Claims



1. A method for selectively controlling plant suckers growing from a desired plant without damaging the remainder of said desired plant, which method comprises the steps of: contacting said plant sucker with an aqueous solution comprising a herbicidally effective amount of urea and sulfuric acid, in which solution the molar ratio of said urea to said sulfuric acid is within the range of about ¼ to about 7/4, and avoiding the contact of said aqueous solution with the foliage of said desired plant which is not associated with said plant sucker.

4,522,645

AGRICULTURAL PYRIDINESULFONAMIDES

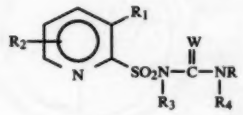
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 227,242, Jan. 22, 1981, Pat. No. 4,435,206, which is a continuation-in-part of Ser. No. 083,753, Oct. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,258, Dec. 4, 1978, abandoned. This application Jan. 6, 1984, Ser. No. 568,889

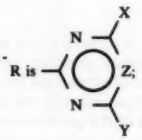
Int. Cl.[3] C07D *401/12;* A01N *43/66, 43/68, 43/70*

U.S. Cl. 71—93 12 Claims

1. A compound of the formula



wherein



Z is N;

R_1 is H, Cl, Br, F, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, NO_2, CF_3, $COOR_5$ or $SO_2NR_6R_7$;

R_2 is H, Cl, Br or CH_3;

R_3 and R_4 are independently H or CH_3;

R_5 is C_1–C_6 alkyl, C_3–C_6 alkenyl, $CH_2CH_2OCH_3$, $CH_2CH_2OCH_2CH_3$, $CH_2CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_6 and R_7 are independently CH_3 or CH_2CH_3;

W is oxygen or sulfur;

X is CH_3, —OCH_3 or —OCH_2CH_3;

Y is H, Cl, CH_3, CF_3, —$NHCH_3$, —$N(CH_3)_2$, —CH_2OR_8, —$CH_2CH_2OR_8$, —OCH_2CF_3 or VR_9; and

V is oxygen or sulfur;

R_8 is CH_3 or CH_3CH_2;

R_9 is CH_3, CH_3CH_2—, $CH_2CO_2R_8$, —$CH_2CH_2OR_8$, $C(CH_3)HCO_2R_8$ or $CH_2CH_2CO_2R_8$; and agricultural salts thereof.

4. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,522,646

3,7-DICHLOROQUINOLINE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Jürgen Markert, Mutterstadt; Helmut Hagen, Frankenthal, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

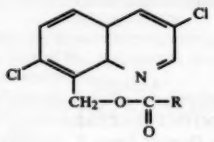
Filed Jun. 23, 1983, Ser. No. 507,109

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223884

Int. Cl.[3] A01N *9/22;* C07D *215/14, 401/12, 405/12*

U.S. Cl. 71—94 9 Claims

1. A 3,7-dichloroquinoline derivative of the formula



(I)

where R is hydrogen, C_1–C_8-alkyl, C_2–C_6-alkenyl, C_1–C_6-hydroxyalkyl, cyclohexyl, or phenyl which is unsubstituted or monosubstituted by nitro, cyano, benzoyl, hydroxyl, methyl, methoxy, halogen, trihalomethyl, amino or dialkylamino where each alkyl is of 1–4 carbons, or is pyridyl, piperazinyl, pyrazinyl, trihalomethyl, unsubstituted benzyl or benzyl substituted by C_1–C_4 alkyl, benzophenonyl, phenoxymethyl or anilinomethyl.

8. A process for combating the growth of unwanted plants, wherein the plants or their location are treated with a herbicidally effective amount of a 3,7-dichloroquinoline derivative of the formula I as claimed in claim 1.

4,522,647

SUBSTITUTED PHENOXYALKANEDIONES AND THEIR HERBICIDAL METHOD OF USE

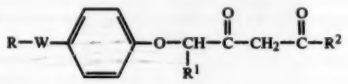
Richard J. Anderson, Palo Alto, and Shy-Fuh Lee, Sunnyvale, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 403,836, Jul. 30, 1982, abandoned. This application Jun. 29, 1983, Ser. No. 508,971

Int. Cl.³ C07D *213/26, 213/64;* **A01N** *43/40*

U.S. Cl. 71—94 **9 Claims**

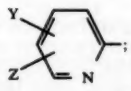
1. A compound of the following formula (A):



(A)

wherein,

R is



R^1 is hydrogen or lower alkyl;

R^2 is lower alkyl;

W is oxygen, sulfur or amino; and

each of Y and Z is independently hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, halogen or nitro.

9. A method for the control of weeds which comprises treating the weed or its locus with a herbicidally effective amount of a compound of formula (A) as disclosed in claim 1.

4,522,648

PROCESS FOR DESULFURIZATION OF GASES WITH MOLTEN MINERAL BATHS DURING GASIFICATION OF CARBON PRODUCTS

Maryan Kunicki, 26, rue Paul Eluard, Corbeil-Essonnes, and Michel Roussel, 97, avenue Victor Hugo, Paris, both of France

Filed May 14, 1984, Ser. No. 610,251

Claims priority, application France, May 20, 1983, 83 08361

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—24 **6 Claims**

1. A process for desulfurization of gases with molten baths obtained from ashes coming from the process of gasification of carbon products and addition of basic products, comprising:

adding to said ashes a metallurgical slag comprising blast-furnace or steel-furnace slag or a mixture thereof, said metallurgical slag having a high basicity index corresponding to a CaO/SiO_2 ratio greater than 1.3 for the molten bath.

4,522,649

METHOD OF FURNACE OPERATION WITH HIGH PELLET BURDENS

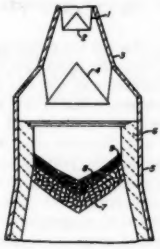
Melvin C. Chang, Johns Island, S.C., and John L. Howell, North Huntingdon Township, Westmoreland County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 406,422, Aug. 9, 1982, Pat. No. 4,436,552. This application Nov. 25, 1983, Ser. No. 555,252

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ C21B *5/00*

U.S. Cl. 75—41 **23 Claims**



1. In the method of producing metal in a shaft furnace containing one or more substantially horizontal layers of coke and one or more separate substantially horiaontal layers of ore above and/or below the coke layers, said layers being positioned across the furnace cross section, and wherein greater than about 80 percent of the ore therein is present in the form of spherical pellets having a size of between about 5 and about 20 mm, the improvement comprising adding between about 1 and about 20 weight percent fine ore material having a screen size of less than about 7 mm, and wherein the size of said fine ore material is less than that of said pellets, on a controlled basis to said furnace adjacent said walls and thereby protect the furnace lining, and wherein prior to adding said fine ore material to said furnace, the ultrafine fraction of said ore material which would present material handling problems when wet or be blown out of the furnace by the hot furnace gases is either (1) separated from said fine material which is added to said furnace, or (2) micropelletized prior to addition to said furnace in order to provide a material having suitable properties for flowing into said furnace.

4,522,650

PROCESS FOR PRODUCTION OF LOW PHOSPHORUS ALLOY

Hidemasa Nakajima; Shozo Okamura; Masanobu Sueyasu; Sakae Furujho; Kohji Okane, all of Tokyo, and Shoji Anezaki, Ibaragi, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Sep. 29, 1983, Ser. No. 537,025

Claims priority, application Japan, Sep. 29, 1982, 57-172319

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—48 **33 Claims**

1. Process for producing an alloy of low phosphorus content by means of a furnace equipped with a lance for injection, said process comprising the steps of:

forming a bath of molten metal by pouring a molten metal in

the furnace, said molten metal containing not more than 0.040% of phosphorus;

injecting by means of said lance into said bath of molten metal a carbonaceous material together with a gasifying agent to gasify the carbonaceous material with the heat of the bath of molten metal and to control the carbon content of the bath of molten metal, said carbonaceous material containing not more than 0.035% of phosphorus;

adding to said bath of molten metal an oxidizable alloying element which is in the form of at least one of the group consisting of metal, metal oxide and metal ore to react with the molten metal thereby forming an alloy; and

recovering the formed gas and, at the same time, obtaining the alloy of low phosphorus content.

4,522,651

FOUNDRY MOLD AND CORE COMPOSITION

Charles E. Seeney, Brazil, and John F. Kraemer, Terre Haute, both of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jan. 25, 1982, Ser. No. 342,313
Int. Cl.³ B28B *7/34*
U.S. Cl. 106—38.3 **10 Claims**

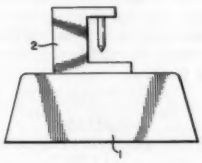
1. A composition adapted for preparing foundry cores and molds consisting of a foundry aggregate 1 to 10% by weight of the aggregate, a binder therefor and 1 to 10% by weight of the aggregate of a hardener, wherein the aggregate is selected from the group consisting of silica sand, olivine, zircon sand, alumino-silica sand and chromite sand, the binder is a linear zinc, potassium or ammonium polyphosphate and the hardner is selected from the group consisting of orthophosphoric acid or a polyvalent metal compound selected from the group consisting of calcium oxide, magnesium oxide, calcium silicate, magnesium silicate and magnesium aluminate or mixtures thereof.

4,522,652

MACHINE BASE AND PROCESS FOR MANUFACTURE THEREOF

Karl-Heinz Neuschäffer, Leichlingen; Hans-Werner Engels, Troisdorf-Sieglar; Hans-Jürgen Gebert, St. Augustin; Robert W. Laube, Siegburg, and Günter Zoche, Bonn, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 5, 1983, Ser. No. 520,682
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3229339; Feb. 2, 1983, 3303409
Int. Cl.³ C09D *1/02*
U.S. Cl. 106—84 **13 Claims**



1. A molded support structure for low-vibration mounting of machines or the like devices which exhibits a compressive strength of at least 60 N/mm^2 and a hardness according to the Mohs scale of 6 to 9 and which comprises a molded structure made by hardening a molding material in a mold to provide a hardened inorganic molding material with a density of 2.2 to 3.0 g/cm^3, said molding material containing 15 to 30 weight % of an aqueous 30–65% potassium hydroxide-potassium silicate solution with an SiO_2:K_2O molar ratio of 1.0–2.0:1, 15–35 weight % of an oxide mixture containing amorphous SiO_2 and aluminum oxide and/or of hydrated amorphous silicic acid in the dispersed powder form and/or metakaolin; and 45 to 65 weight % inorganic particulate filler.

4,522,653

SALT CEMENT DISPERSANT AND METHOD OF USING SAME IN CEMENTING SUBTERRANEAN WELLBORE

S. Prabhakara Rao, Duncan; Lance E. Brothers, Lawton, and Bobby G. Brake, Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 3, 1984, Ser. No. 596,229
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—90 **28 Claims**

1. In a method for cementing a subterranean wellbore wherein a salt cement slurry is pumped into the wellbore for cementing therein, the improvement which comprises including in said salt cement slurry an additive comprising:

copolymers having a molecular weight average in the range of 10,000 to 100,000 and comprised of repeating monomer units in the range of 85 to 99 mole percent sodium vinylsulfonate and in the range of 1 to 15 mole percent of at least a selected one of the group consisting of acrylamide and acrylic acid.

20. A reduced viscosity salt cement slurry for cementing wellbores penetrating subterranean formations comprising:

water;

an inorganic salt dissolved in said water in the range of from 5 percent by weight of said water to a saturated amount;

an additive for reducing the viscosity of said salt cement slurry comprised of a copolymer or mixture of copolymers having a molecular weight average in the range of 10,000 to 100,000 and comprised of repeating monomer units in the range of 85 to 99 mole percent sodium vinylsulfonate and in the range of 1 to 15 mole percent of at least a selected one of the group consisting of acrylamide and acrylic acid, the copolymers having been obtained by polymerization of the monomers; and

cement mixed with said water, salt and additive in an amount such that said cement slurry is suitable for cementing wellbores penetrating subterranean well formations.

4,522,654

CONTINUOUS METHOD OF PRODUCING PHTHALOCYANINE PIGMENT DISPERSIONS IN ORGANIC SOLVENT

Dominick Chisvette, Colonia; James Lattimore, Paterson, and Stanley G. Sova, Clifton, all of N.J., assignors to Inmont Corporation, Clifton, N.J.

Filed Dec. 23, 1983, Ser. No. 564,666
Int. Cl.³ C08K *5/34*; C09D *11/00*; C07D *207/00*
U.S. Cl. 106—288 Q **10 Claims**

1. The method of converting a phthalocyanine crude wherein at least 80% of the crude particles have a size greater than 1 micrometer to a dispersed form which is useful in inks and coatings, said method comprising

(A) premixing phthalo crude at about 10 to 50% by weight with from about 5 to 20% by weight of surfactant based on pigment in a binder containing an organic solvent, said premixing being accomplished by agitation to break down loose crude agglomerates and obtain a uniform blend of the crude without appreciably reducing the particle size of the crude, and

(B) continuously pumping the blend of (A) through at least one but preferably two shot mills containing between 50 and 90% by volume of a grinding media that has a size of from about 0.1 to 2.5 mm. diameter and then grinding at such rate that the particle size has been reduced to pigment particle size.

4,522,655
METAL PIGMENT OF IMPROVED STORAGE RESISTANCE

Pamela L. Claassen, Lower Burrell, and A. David Booz, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 5, 1983, Ser. No. 510,983

Int. Cl.³ C04B *31/18;* **C08K** *3/08;* **C09C** *1/62;* **C09D** *5/10*

U.S. Cl. 106—290 **16 Claims**

1. In a composition of matter comprising a pretreated metallic pigment having a leafing character, and an additive inhibiting reaction of the pigment to form hydrogen gas, the improvement comprising an effective amount, based on the metallic pigment content, of a liquid fatty acid to reverse, negate, or reduce loss of optical properties which would occur in the absence of such fatty acid.

4,522,656
METHOD OF MAKING REFERENCE SURFACE MARKINGS ON SEMICONDUCTOR WAFERS BY LASER BEAM

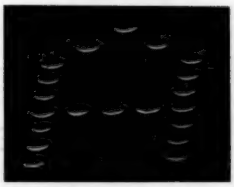
Franz Kuhn-Kuhnenfeld, Emmerting; Josef Kramler, Burgkirchen, and Hans-Adolf Gerber, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft Für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,301

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324511

Int. Cl.³ H01L *21/265;* **B23K** *27/00*

U.S. Cl. 148—1.5 **5 Claims**



1. In a method for the characterization of semiconductor surfaces by means of surface patterns, which are each generated by melting and partial vaporization of a surface segment by means of a laser pulse, the improvement comprising the steps of:

irradiating by means of a laser pulse a surface segment of the semiconductor surface whose surface area corresponds to 1.5 to 6.5 times the surface area of the desired surface pattern; and

adjusting the energy of the laser pulse so that melting and partial vaporization of the semiconductor material takes place only in the center of said surface segment on a surface of the semiconductor material corresponding to the desired surface pattern.

4,522,657
LOW TEMPERATURE PROCESS FOR ANNEALING SHALLOW IMPLANTED N+/P JUNCTIONS

Ajeet Rohatgi, Murrysville; Prosenjit Rai-Choudhury, Export, both of Pa.; Joseph R. Gigante, Beltsville, Md.; Ranbir Singh, and Stephen J. Fonash, both of State College, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

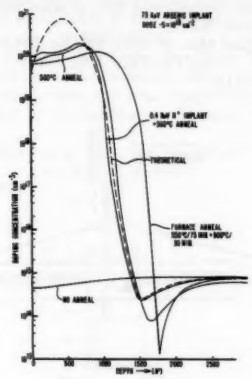
Filed Oct. 20, 1983, Ser. No. 543,745

Int. Cl.³ H01L *21/263*

U.S. Cl. 148—1.5 **11 Claims**

1. A method of low temperature annealing of a silicon semiconductor that has been doped by ion implantation with an element selected from the group consisting of arsenic and phosphorous, said method comprising:

ion beam implantation of hydrogen ions subsequent to and in the same area as the element selected from the above group that has been implanted, and



annealing the semiconductor at a temperature between about 500° C. and about 600° C. for a time of about one hour in an inert atmosphere.

4,522,658
METHOD AND COMPOSITION FOR PROTECTING METAL SURFACES FROM OXIDATIVE ENVIRONMENTS

Michael L. Walker, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 21, 1984, Ser. No. 623,276

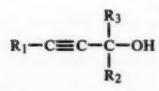
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.³ B05D *5/00*

U.S. Cl. 148—6.14 R **18 Claims**

1. A method of inhibiting the oxidative effect of an oxidative environment in contact with a metal which comprises:

contacting a metal surface with a composition comprising an aqueous fluid, an effective amount of at least one acetylenic alcohol having the general formula



wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen, alkyl, phenyl, substituted phenyl and hydroxy-alkyl radicals; a quaternary ammonium compound selected from the group consisting of N-methyl, N-benzyl and chloromethyl naphthalene quaternaries of alkyl pyridines and quinoline, isoquinoline compounds, benzoquinoline compounds and mixtures thereof,

a hydrocarbon compound which exhibits high oil-wetting characteristics, and

an antimony compound capable of activation by the other constituents of said composition whereby the oxidative effect of an oxidative environment in contact with said metal is reduced; and,

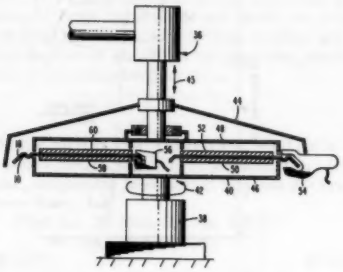
forming a surface coating comprising at least a portion of the constituents of said composition on said metal surface which is capable of inhibiting the oxidative effects of an oxidative environment upon said metal surface.

4,522,659

METHOD AND APPARATUS FOR THE MANUFACTURE OF RECORD STAMPERS

John J. Prusak, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,822
Int. Cl.[3] C22F *1/00, 1/10*
U.S. Cl. 148—11.5 R 10 Claims



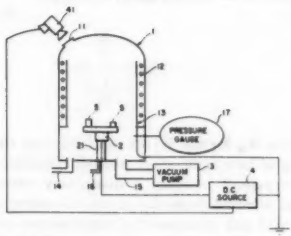
1. In the method for the manufacture of a record stamper wherein a flat stamper blank having an inner edge, a recorded section and an outer edge is electroformed from a metal of a first hardness and then the inner edge and the outer edge are shaped to a predetermined configuration, the improvement which comprises: selectively annealing at least one of the edges to reduce the hardness of the metal of the edge to less than that of the first hardness whereby a stamper is obtained having a recorded section of the first hardness and at least one edge of reduced hardness and increased ductility.

4,522,660

PROCESS FOR ION NITRIDING OF ALUMINUM OR AN ALUMINUM ALLOY AND APPARATUS THEREFOR

Takatoshi Suzuki, Anjo; Hideo Tachikawa, and Shigeo Moriyama, both of Aichi, all of Japan, assignors to Kubushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jun. 3, 1983, Ser. No. 501,001
Claims priority, application Japan, Jun. 4, 1982, 57-96836
Int. Cl.[3] C21D *1/48*
U.S. Cl. 148—20.3 7 Claims



1. A process for ion nitriding of aluminum or an aluminum alloy comprising the steps of:

disposing aluminum or an aluminum alloy as an article to be treated on a substrate holder provided in a sealed container and disposing an oxygen getter metal having an intensive affinity for oxygen in such proximity to said article that said oxygen getter metal may react with oxygen around said article to prevent said oxygen from being caught on the surface of said article, said oxygen getter metal being at least one metal selected from the group consisting of a group IIa element, a group IIIa element, a group IIIb element, a group IVa element, a group Va element and a group VIa element of the Periodic table, or an alloy of at least one such metal;

replacing gas in said sealed container by a nitriding gas, oxygen and oxidizing gas remaining in said nitriding gas being caught by said oxygen getter metal; and

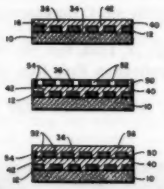
creating a glow discharge between an electrode provided in said sealed container, which is used as an anode, and the substrate holder, which is used as a cathode, thereby forming an aluminum nitride layer on the surface of said article without the effect of oxygen or oxidizing gas in the nitriding gas.

4,522,661

LOW DEFECT, HIGH PURITY CRYSTALLINE LAYERS GROWN BY SELECTIVE DEPOSITION

Andrew D. Morrison, Altadena, and Taher Daud, LaCrescenta, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 24, 1983, Ser. No. 507,624
Int. Cl.[3] H01L *21/20, 21/76*
U.S. Cl. 148—33.2 6 Claims



1. A semiconductor article comprising:

a blank of semiconductor having a first level of impurities;

a film of a first mask having a pattern of openings applied to a surface of the blank and said film being impervious to diffusion of said impurities from said semiconductor surface;

a first continuous layer of grown semiconductor on said mask extending from said openings over the bridges of mask between the openings to form a first continuous layer of semiconductor having a lesser level of impurities and defects than said blank, and having less defects and impurities in areas overlying said bridges than areas overlying said openings;

a second film of mask impervious to diffusion of said impurities having a pattern of openings in registration with the bridges of the first mask and a pattern of bridges overlying the openings in the first mask; and

a second continuous layer of semiconductor grown on said second mask having a lower impurity and defect level than the first layer, said second layer extending from said openings and over the bridges of the second mask to form said second continuous layer.

4,522,662

CVD LATERAL EPITAXIAL GROWTH OF SILICON OVER INSULATORS

Donald R. Bradbury, Palo Alto; Chi-Wing Tsao, Piedmont, and Theodore I. Kamins, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 12, 1983, Ser. No. 522,804
Int. Cl.[3] H01L *21/205, 21/76*
U.S. Cl. 148—175 24 Claims

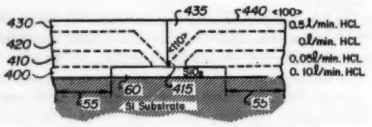
1. A method for producing a semiconductor structure comprising the steps of:

forming a non-nucleating insulating layer over a semiconductor substrate;

removing a portion of said insulating layer to form an insu-

lating region, said insulating region being surrounded by an exposed surface region of the semiconductor substrate;

forming a first epitaxial semiconductor layer over said exposed surface region to form an essentially flat surface with said insulating layer, said first semiconductor layer being formed in an environment having a first concentration of reactant; and



forming a second epitaxial semiconductor layer over said first semiconductor layer and laterally covering a portion of said insulating region substantially without voids therebetween, said second semiconductor layer being formed in an environment having a second concentration of reactant, said second concentration being different than the first concentration of reactant.

4,522,663

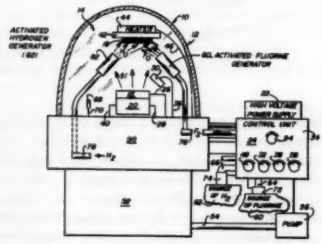
METHOD FOR OPTIMIZING PHOTORESPONSIVE AMORPHOUS ALLOYS AND DEVICES

Stanford R. Ovshinsky, Bloomfield Hills, and Masatsugu Izu, Birmingham, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Division of Ser. No. 185,520, Sep. 9, 1980, Pat. No. 4,342,044, which is a continuation-in-part of Ser. No. 884,664, Mar. 8, 1978, Pat. No. 4,217,374, and a continuation-in-part of Ser. No. 104,285, Dec. 17, 1979, abandoned, which is a division of Ser. No. 884,664. This application Apr. 14, 1982, Ser. No. 368,221 The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.

Int. Cl.³ C22C *28/00*; H01L *31/18*

U.S. Cl. 148—403 **25 Claims**



1. A method of making an improved photoresponsive amorphous alloy, said method comprising depositing on a substrate a material including at least silicon and incorporating in said material at least one density of states reducing element, said element being fluorine, and introducing at least one band gap adjusting element into said material without substantially increasing the states in the band gap to produce an alloy having a band gap adjusted for a specified photoresponse wavelength threshold.

22. An amorphous alloy made by the process of claim 1 wherein said adjusting element is germanium.

4,522,664

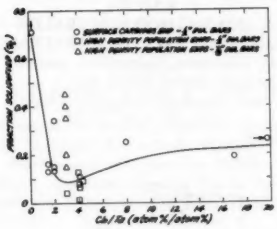
PHASE STABLE CARBIDE REINFORCED NICKEL-BASE SUPERALLOY EUTECTICS HAVING IMPROVED HIGH TEMPERATURE STRESS-RUPTURE STRENGTH AND IMPROVED RESISTANCE TO SURFACE CARBIDE FORMATION

Michael F. X. Gigliotti, Jr., Scotia; Swe-Wong Yang, Clifton Park; Melvin R. Jackson, Schenectady, all of N.Y.; Charles A. Bruch, Cincinnati, Ohio, and Xuan Nguyen-Dinh, Chandler, Ariz., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,617

Int. Cl.³ C22C *19/03*

U.S. Cl. 148—404 **6 Claims**



1. A unidirectionally solidified anisotropic composite article of manufacturing having improved high temperature stress-rupture strength with improved resistance to the formation of surface nucleated carbides comprising:

(a) a nickel-base superalloys matrix and

(b) an aligned fibrous monocarbide eutectic reinforcing phase embedded in said matrix,

said article being of a substantially phase stable alloy consisting essentially of tantalum, columbium and carbon; one or more elements selected from the group consisting of chromium, aluminum, cobalt, tungsten, molybdenum, rhenium, vanadium, hafnium, and zirconium; boron in an amount greater than an impurity amount up to about 0.05%, the balance being essentially nickel and incidental impurities, subject to the provisos that, by weight percent,

$$3.4 \leqq (Mo+W) \leqq 10.4 \quad \text{(i)}$$

and

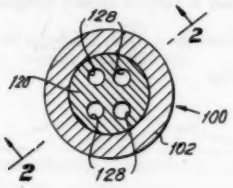
$$1 \leqq (Cb/Ta) \leqq 4.5. \quad \text{(ii)}$$

4,522,665

PRIMER MIX, PERCUSSION PRIMER AND METHOD FOR INITIATING COMBUSTION

Donald N. Yates, Jr., and Michael Oestrich, both of Katy, Tex., assignors to GEO Vann, Inc., Houston, Tex.

Filed Mar. 8, 1984, Ser. No. 587,344
Int. Cl.³ C06B 45/02
U.S. Cl. 149—21 **19 Claims**



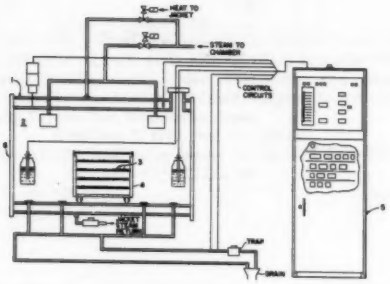
1. As an article of manufacture a primer mix, which consists essentially of from 26 to 66 weight percent titanium and from 74 to 44 weight percent potassium perchlorate having a density of from 2.1 to 2.5 g/cc.

4,522,666

APPARATUS AND METHOD FOR SEALING CAPSULES BY APPLICATION OF VACUUM AND STEAM THERETO

Fritz Wittwer, Lupsingen, Switzerland, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 9, 1982, Ser. No. 440,371
Int. Cl.³ B29C 27/02
U.S. Cl. 156—69 **16 Claims**



1. A method for sealing capsules made from hydrophilic polymer, having hard shell coaxial cap and body parts which overlap when telescopically joined, comprising the steps of:

A. placing the capsules within a process vessel having a heated-jacketed chamber;

B. evacuating air from the chamber so as to cause a vacuum therein;

C. exposing the capsules within the chamber for a time period so as to also cause a vacuum within the capsules;

D. injecting steam into the chamber so as to break the vacuum therein and to increase the temperature, relative humidity and pressure within the chamber and within the capsules;

E. melting the hydrophilic polymer by the entry of steam within the overlap of the cap and body parts;

F. evacuating excess steam from the chamber so that the capsules do not swell, melt or deform;

G. exposing the capsules to vacuum within the chamber so as to evaporate water from the melted hydrophilic polymer within the overlap of the cap and body parts;

H. cooling the capsules so as to gel the hydrophilic polymer within the overlap between the cap and body parts thereby sealing the tamper-proof capsules; and

I. drying the capsules to a stable water content for shipment and use.

16. Apparatus for sealing capsules made from hydrophilic polymer, having hard shell coaxial cap and body parts which overlap when telescopically joined, comprising

a process vessel having a chamber therein for receiving the capsules;

means for evacuating air from the chamber so as to cause a vacuum within said chamber and within the capsules;

means for injecting steam into the chamber so as to increase the temperature, relative humidity and pressure within said chamber and within the capsules, thereby melting the hydrophilic polymer within the overlap of the cap and body parts by the entry of steam within said overlap;

means for evacuating excess steam from the chamber and causing a vacuum within said chamber so that the capsules do not swell, melt or deform, and water is evaporated from the melted hydrophilic polymer within the overlap of the cap and body parts; and

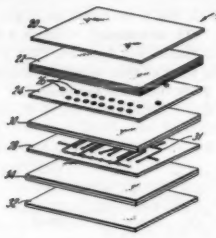
means for cooling the capsules so as to gel the hydrophilic polymer within the overlap between the cap and body parts, thereby sealing the capsules.

4,522,667

METHOD FOR MAKING MULTI-LAYER METAL CORE CIRCUIT BOARD LAMINATE WITH A CONTROLLED THERMAL COEFFICIENT OF EXPANSION

John R. Hanson, Richmond; James L. Hauser, Lenox; James F. Kilfeather, Jr., Pittsfield, and Hendrik B. Hendriks, Becket, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 162,827, Jun. 25, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,275
Int. Cl.³ B32B 31/16, 31/06, 31/12; H05K 1/00
U.S. Cl. 156—87 **5 Claims**



1. A method of making a multi-layer metal core circuit board laminate having a thermal coefficient of expansion less than that of a non-metal core laminate and conductive layers for use with leadless components, said method comprising the steps of:

a. providing an uppermost planar copper foil conductive layer and a stabilizing layer formed of a metal having a thermal coefficient of expansion less than that of the non-metal portions of the laminate and copper conductive layer;

b. providing a bonding layer interposed between said copper conductive layer and said stabilizing layer, said bonding layer being formed of resin impregnated glass cloth;

c. laminating said layers to form a partial composite laminate structure;

d. providing a printed circuit board layer and a lowermost planar copper foil layer;

e. providing a second bonding layer between said printed circuit board layer and said lowermost copper foil layer;

f. providing a third bonding layer between the lower surface of said stabilizing layer and the upper surface of said

printed circuit board layer, said second and third bonding layers being formed of resin impregnated glass cloth; and

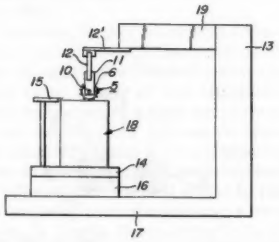
g. laminating said layers to provide a complete composite laminate structure having a thermal coefficient of expansion less than that of the bonding layers and the copper conductive layers.

4,522,668

METHOD OF PRODUCING CERAMIC FILTER

Yutaka Ogawa, Nagoya; Tsunezo Takeuchi, Chita, and Masashi Otaka, Mie, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 21, 1983, Ser. No. 487,266
Claims priority, application Japan, Sep. 30, 1982, 57-169619
Int. Cl.³ C03B *29/00*; C04B *33/34, 37/00*
U.S. Cl. 156—89 **21 Claims**



1. A method of producing a ceramic honeycomb filter, comprising the steps of:

attaching a film to at least one open end surface of a ceramic honeycomb body which is to be selectively sealed, said ceramic honeycomb body having throughholes extending therethrough in a longitudinal and lateral direction at a certain

placing said ceramic honeycomb body on a support board to position said film immediately below a heated gear rotatably mounted on a resilient holding means, wherein said heated gear has heated pointed teeth attached thereto, said heated teeth being positioned complementary with tooth positions defined on a root cylinder of the heated gear at a tooth root pitch which is less than said pitch of the throughholes, said heated pointed teeth having such a tooth depth that adjacent heated teeth can simultaneously thrust into adjacent throughholes or every other throughhole, while tips of said pointed teeth can roll along a locus passing inside of said throughholes;

actuating relative movement between said holder and said support board;

swaying the heated gear in response to rotation of the heated gear so as to make up for a difference between the tooth root pitch of the gear and the throughhole pitch of the ceramic honeycomb body, for perforating said film at positions corresponding to desired open ends of the ceramic honeycomb body throughholes to be sealed; and

pressing a sealant into said ceramic honeycomb body through the thus perforated holes of the film, whereby the ceramic honeycomb body becomes a ceramic honeycomb filter having the throughholes thereof selectively sealed at the desired open ends thereof, to provide a checkered flag pattern.

13. A method of producing a ceramic honeycomb filter, comprising the steps of:

attaching a film to at least one open end surface of a ceramic honeycomb body which is to be selectively sealed, said ceramic honeycomb body having throughholes extending therethrough in a longitudinal and lateral direction at a certain pitch;

placing said ceramic honeycomb body on a support board to position said film immediately below a heated gear rotatably mounted on a holding means, wherein said heated gear has heated pointed teeth attached thereto, wherein said heated teeth being positioned complementary with tooth positions defined on a root cylinder of the heated gear at a tooth root pitch which is less than said pitch of the throughholes, said heated pointed teeth having such a tooth depth that adjacent heated teeth can simultaneously thrust into adjacent throughholes or every other throughhole, while tips of said pointed teeth can roll along a locus passing inside of said throughholes;

actuating relative movement between said holder and said support board;

swaying the heated gear in response to rotation of the heated gear so as to make up for a difference between the tooth root pitch of the gear and the throughhole pitch of the ceramic honeycomb body, for perforating said film at positions corresponding to desired open ends of the ceramic honeycomb body throughholes to be sealed, wherein said swaying is effected by providing a gap between a central hole of the heated gear and a shaft which is connected to said holding means and by supporting said heated gear by a resilient supporting means; and

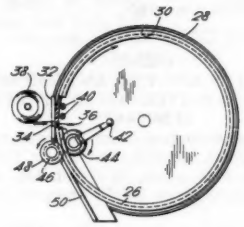
pressing a sealant into said ceramic honeycomb body through the thus perforated holes of the film, whereby the ceramic honeycomb body becomes a ceramic honeycomb filter having the throughholes thereof selectively sealed at the desired open ends thereof, to provide a checkered flag pattern.

4,522,669

COMBINATION MOULD PORTION AND PROTECTIVE ELEMENT FOR PIPE

Olof Nordin, and Sören Forsberg, both of Värnamo, Sweden, assignors to Forsheda AB, Forsheda, Sweden

Filed Sep. 1, 1982, Ser. No. 413,823
Claims priority, application Sweden, Sep. 4, 1981, 8105254
Int. Cl.³ B29D *27/00*; B65H *69/02*; B29C *17/02*; B28B *7/20*
U.S. Cl. 156—157 **26 Claims**



1. A method of manufacturing a combination mould portion and protective element from a flat cut blank of thermoplastic material having first and second opposite surfaces to protect therewith surfaces of an article adapted to be connected to another article, comprising the steps of:

(a) positioning the flat cut blank on a guide bar between a pair of drive and driven rollers;

(b) positioning an end of an adhesive coated tape strip so that it extends across the feed path of said blank;

(c) driving the blank with the drive roller so that an end of said blank adhesively contacts the tape strip, the end of said tape strip projecting outwardly from the first surface of the blank while a remaining part of the tape strip is located facing the second surface;

(d) guiding the blank along an arcuate guide surface with the drive roller so that the blank is progressively formed into an annular element with the first surface being an outer peripheral surface thereof and said second surface being an inner peripheral surface thereof with opposite ends of said blank located facing and adjacent each other to define

a joint or slit through which said end of said tape strip passes; and

(e) progressively supplying the remaining portion of said tape strip into overlapping adhesive contact with the outer peripheral surface including the joint.

4,522,670

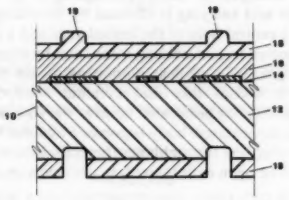
PROCESS FOR MANUFACTURE OF TAMPER-RESISTANT POLYESTER CREDIT CARDS

R. Scott Caines, Greer, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Apr. 4, 1983, Ser. No. 482,089

Int. Cl.³ B29C *17/04;* **B32B** *32/00;* **C09J** *5/00;* **B41M** *3/14*

U.S. Cl. 156—220 **15 Claims**



1. A method of preparing a credit or identification card comprising:

(a) providing a supply of substantially amorphous polyester sheet material;

(b) embossing a surface of said sheet material under pressure with numerical and/or letter characters;

(c) holding said sheet material under restraint while heating said sheet material to a temperature and for a time sufficient to substantially crystallize at least the embossed portion of said amorphous polyester sheet; and

(d) cooling said sheet material.

4,522,671

METHOD OF APPLYING AN ELECTRICAL CONDUCTOR PATTERN ON AN APERTURED SUBSTRATE

Werner Grünwald, Gerlingen; Heinz Pfizenmaier, Leonberg; Claudio de la Prieta, Stuttgart; Kurt Schmid, Ditzingen, and Ewald Schmidt, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,033

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145585

Int. Cl.³ B44C *1/14;* **B32B** *31/00;* **B29C** *19/00;* **H01F** *7/06*

U.S. Cl. 156—235 **7 Claims**

1. Method of making an electrical inductance, comprising the steps of

providing a carrier of insulating material (**30**);

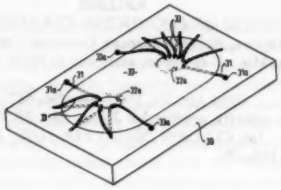
applying a pattern of conductive tracks (**31**) forming partial windings, or portions of windings, on a surface of said carrier;

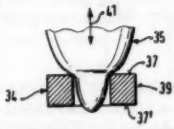
applying a core body (**32**) of ferrite material on the surface of said carrier, said core body having a core surface and a through-opening through the body extending to the carrier surface;

providing an elastically deformable printing stamp having a penetrating portion which is dimensioned to enter into the through-opening (**32***a*) of the core body;

applying to a surface of said deformable printing stamp, including a surface of said penetrating portion, a pattern of an electrically conductive paste in the form of conductive tracks, positioned to connect with the conductive tracks (**31**) applied on the carrier surface (**30**), when the conductive paste is transferred to the core body (**32**);

pressing said printing stamp, with the paste applied thereto, against a surface of the core body including the region of the aperture, with sufficient pressure to deform the printing stamp to the extent that the penetrating portion thereof penetrates within the aperture, and said surface of





the stamp engages the surface defining the aperture of the core body to transfer at least a portion of the conductive paste on the surface of the core body, including the surface of said aperture, the conductive tracks (**31**) being applied on the carrier and the transferred paste forming closed conductive loops extending on both sides of the ferrite core body.

4,522,672

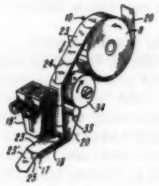
COMPOSITE LABEL WEB AND METHOD OF MAKING AND METHOD OF APPLYING LABELS

Eneas E. Brister, Fairborn, and Frederick P. Williams, Kettering, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 238,505, Feb. 26, 1981, Pat. No. 4,390,577. This application Feb. 24, 1983, Ser. No. 469,185

Int. Cl.³ B44C *1/16;* **B32B** *31/00;* **B65C** *9/18;* **B41F** *1/08*

U.S. Cl. 156—238 **7 Claims**



1. Method of applying labels from a composite label web using a labeler having a label applicator and a label delaminator, comprising the steps of: providing a longitudinally extending carrier web having an outer free end and label material releasably adhered by pressure sensitive adhesive to the carrier web, the composite label web having been wound into a roll, non-rectilinear cuts across the label material at longitudinally spaced locations defining leading and trailing edges of labels with each label having at least three projecting portions including at least one forwarded projecting portion and at least one rearwardly projecting portion with the leading edge of each label being closer to the outer free end of the carrier web than the respective trailing edge, advancing the composite label

web stepwise from the roll toward the delaminator to a position in which only a part of the forwardly projecting portion of a label is delaminated from the carrier web, thereafter advancing the carrier web stepwise again to dispense the label into label applying relationship with respect to the label applicator to a position in which only a part of the rearwardly projecting portion of the label is adhered to the carrier web, and thereafter applying the label using the label applicator.

4,522,673

HEAT INSULATING BLANKET

Barry M. Fell, Dublin, Calif., and Peter R. Ciriscioli, Reno, Nev., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Apr. 30, 1982, Ser. No. 373,757

Int. Cl.³ B29C *25/00;* **B32B** *7/08;* **F04B** *1/78;* **F16L** *59/00*

U.S. Cl. 156—307.3 **30 Claims**

1. A heat insulating blanket comprising: a layer of woven fibrous material having a curable thermosetting resin impregnated therein and capable of withstanding temperatures up to a predetermined value; a layer of high temperatures thermal insulating material comprising a loose mat of particles; a layer of heat and fire resistant fabric between the fibrous material layer and the insulating material layer; and means coupling the layers together to form a composite insulating blanket adapted to be placed adjacent to a structural part to be protected.

11. A heat insulating blanket comprising: a layer of fibrous material having a curable thermosetting resin impregnated therein and capable of withstanding temperatures up to a predetermined value; a layer of high temperature thermal insulating material, there being a pair of opposed layers of heat and fire resistant fabric on opposite sides of the layer of insulating material, one of the fabric layers being coupled to the layer of fibrous material; and a thread stitched through said fibrous material layer, the insulating material layer, and the fabric layer for coupling the layers together to form a composite insulating blanket adapted to be placed adjacent to a structural part to be protected.

23. A method of making a fireshield for separating a pair of adjacent structural parts comprising: providing a heat insulating blanket formed from a layer of woven fibrous material impregnated with a curable thermosetting resin and separated from and coupled to a layer of high temperature thermal insulating material by a heat and fire resistant layer of fabric material; arranging the heat insulating blanket in a predetermined shape; and curing the resin when the same has said shape to cause the layer of fibrous material to become relatively rigid and to support the insulating material.

27. A method of making a fireshield for separating a pair of adjacent structural parts of adjacent structural parts comprising: providing a heat insulating blanket formed from a layer of fibrous material impregnated with a curable thermosetting resin and coupled to a layer of high temperature thermal insulating material; placing the heat insulating blanket in a predetermined shape adjacent to a structural part with said layer of fibrous material in engagement with one surface of the structural part; and curing the resin when the same has said shape to cause the layer of fibrous material to become relatively rigid and to support the insulating material, said curing step being performed when said layer of fibrous material is in engagement with said surface, whereby the layer of fibrous material is bonded to said structural part when the resin is cured.

30. A method of making a fireshield for separating a pair of adjacent structural parts comprising: providing a layer of high temperature thermal insulating material coupled to layer of woven ceramic cloth made from continuous ceramic fiber impregnated with a curable thermosetting resin; forming the layers into a predetermined shape; and curing the resin to cause the impregnated layer to become rigid and self-supporting.

4,522,674

SURFACE TREATMENT APPARATUS

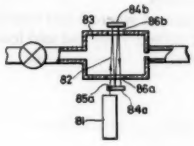
Ken Ninomiya, Nakano; Keizo Suzuki, Hachioji, and Shigeru Nishimatsu, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,325

Claims priority, application Japan, Jan. 24, 1983, 58-8731

Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06;* **C23C** *13/08*

U.S. Cl. 156—345 **10 Claims**



1. A surface treatment apparatus wherein a material gas is introduced into a surface treatment chamber and activated therein, and wherein the surface of a specimen placed in said surface treatment chamber is treated by reactive species of said material gas generated by said activation, said surface treatment apparatus further comprising a preliminary chamber for receiving a material gas, means for supplying controllable energy through a wall of said preliminary chamber to said material gas to activate said material gas in a stage preceding said surface treatment chamber, and means for introducing the material gas containing particles thus activated into said surface treatment chamber wherein said initially activated material gas is further activated to treat the surface of said specimen.

4,522,675

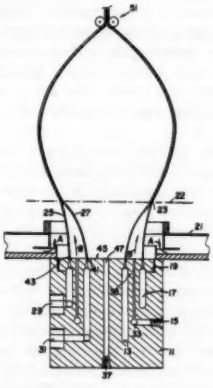
METHOD FOR FORMING A LAMINATED FILM CONTAINING DIFFERENT POLYMER LAYERS

Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1983, Ser. No. 531,881

Int. Cl.³ B29C *19/00*

U.S. Cl. 156—244.11 **14 Claims**



1. A method for coextruding a laminated film containing at least two dissimilar polymer layers comprising the steps of:

providing a die having at least first and second flow paths through which at least two polymer melts can be extruded as individual polymer layers, said flow paths terminating at respective die gaps;

feeding a non-foamed polymer melt through a first flow path of said die;

feeding a foamed polymer melt through a second flow path of said die;

drawing said non-foamed and said foamed polymer melts away from said die as separate non-contacting layers, while expanding them to different degrees; and,

contacting said non-foamed and said foamed polymer melt layers so they adhere together to form a film at a weld point spaced from said die which is at or near a frost line of said polymer melts.

7. The method of claim 1 wherein said non-foamed polymer melt is a non-foamed polyethylene and said foamed polymer is a foamed polyethylene.

4,522,676

APPARATUS FOR MANUFACTURING A ROOF LINING FOR AUTOMOBILES

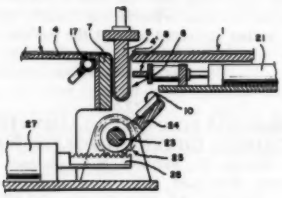
Mikami Masao, 9-19, 1-chome Kogo-minami, Nishi-Ku, Hiroshima, Japan

Filed Aug. 24, 1983, Ser. No. 526,148

Claims priority, application Japan, Sep. 7, 1982, 57-156454

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—443 **8 Claims**



1. An apparatus for manufacturing a roof lining for automobiles comprising:

a sheet feeding section comprising a means for feeding forward a sheet of a predetermined length required for a single roof lining made of thermoplastic material on a table and for causinng the feeding of the sheet to temporarily stop where a wire pocket is formed through which a resting wire is inserted later and a means for firmly holding a leading edge of said sheet after said sheet is fed forward;

a loop forming section comprising a vertically movable depressing tool which is disposed above the table and has substantially the same width as the table, said loop forming section lowering said depressing tool through a slip formed on the table onto the sheet to form a U-shaped loop;

a welding section disposed below the table, said welding section comprising a welding bar and an anvil plate located opposite to said welding bar, said welding section forming a cylindrical wire pocket extending across the width of the sheet by thrusting the upper part of the U-shaped loop against said anvil plate by said welding bar to weld it together using thermal energy generated by high frequency current or the like; and

a cutting section including cutting edges for forming cutouts at both the end parts of the wire pocket and at the central part of the wire pocket as required, said cutting section practicing cutting operation by crashing the wire pocket against the anvil plate by means of said cutting edges.

4,522,677

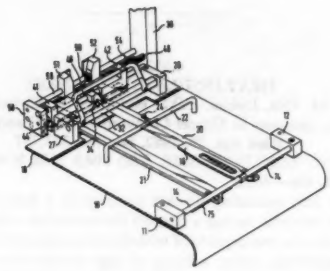
FELLER ATTACHMENT FOR A HEAT-SEALING MACHINE FOR BELTS

Elmar Kuhn, Wuppertal, Fed. Rep. of Germany, assignor to Astor-Werk, Otto Berning & Co., Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,723

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—467 **7 Claims**



1. Feller attachment for a heat-sealing machine for belts, with a feller plate, with feller gibs on the feller plate, these feller gibs being arranged at a certain distance from each other and extending in the direction of feed and serving to fell a cover material around the interlining of a belt, with a feeding device for feeding a belt cover band, and a comb for stretching and smoothing the cover material over the interlining prior to applying the belt cover band, characterized by

an adjusting device for adjusting the distance of the ends (**60, 61**) of the feller gibs (**20, 21**) to each other, this adjusting device meshing with the ends (**60, 61**) of the feller gibs (**20, 21**), with these ends pointing toward the heat-sealing machine for belts, and consisting of a sliding bar (**44**) with sliding bearings (**41, 42**) arranged thereon and a threaded spindle (**46**) which meshes with tapped holes (**62, 63**) in the sliding bearings (**41, 42**), with the threads (**64, 65**) on both ends of the threaded spindle (**46**) as well as the tapped holes (**64, 63**) in the sliding bearings (**41, 42**) exhibiting opposite thread pitches, and guides (**37, 38**) which are arranged on the lower end (**66, 67**) of each sliding bearing (**41, 42**), this guide having recesses (**68, 69**) which hold the projections (**70, 71**) on each end (**60, 61**) of the feller gibs (**20, 21**), with the ends (**72, 73**) of the feller gibs (**20, 21**) being guided in slotted holes (**74, 75**) which extend at right angles to the direction of feed,

an adjusting device for the guide pieces (**51, 52**) for the belt cover band, and

an adjusting device for the comb (**40**).

4,522,678

TRANSVERSELY ADJUSTABLE PROFILE DIE BLOCK

Larry M. Zieke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

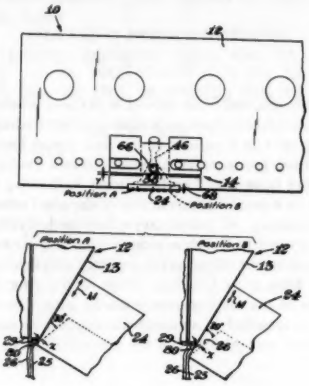
Filed Oct. 21, 1982, Ser. No. 435,849

Int. Cl.³ B29B *7/14;* **B29C** *19/00;* **B29D** *3/00;* **B29G** *2/00*

U.S. Cl. 156—501 **3 Claims**

1. Apparatus for extruding a protrusion on a film or sheet, said apparatus comprising a film or sheet die with an elongated extrusion slot for extruding said film or sheet, a die block for extruding said protrusion onto said film or sheet, the die block mounted on said die adjacent the extrusion slot of the die, said die block presenting a profile extrusion orifice closely adjacent said extrusion slot and in open communication therewith, said die block comprised of a stationary mounting block, a plate holder, an eccentric pin, and an extrusion plate defining apertures for said protrusion, the die block movable transversely along the surface of said die to enlarge or diminish the extru-

sion orifice to affect the size and configuration of the base of the protrusion as it engages and joins said film or sheet and the



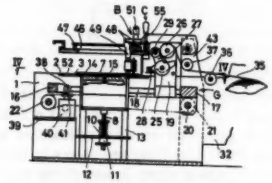
longitudinal location of where the profile joins the film or sheet.

4,522,679

APPARATUS FOR STICKING ADHESIVE FILM ON A RING AND A THIN ARTICLE

Keigo Funakoshi, Ibaraki, and Minoru Ametani, Takatsuki, both of Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1984, Ser. No. 629,877
Claims priority, application Japan, Sep. 13, 1983, 58-170393
Int. Cl.³ B26D *1/26*; B32B *31/18*
U.S. Cl. 156—510 **3 Claims**



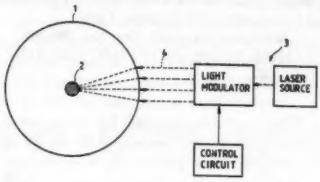
1. An apparatus for sticking an adhesive film on a ring as a carrier and a thin article such as a silicon wafer comprising:
- a frame;
- a table mounted on said frame for holding the ring thereon;
- a table mounted on said frame for holding the thin article thereon;
- sticking means adapted to move along the top surface of said tables for pressing the adhesive film against the ring and the thin article to stick it thereon;
- a cutter supporting frame pivotally mounted on said frame at one end thereof;
- cutting-out means mounted on said cutter supporting frame for cutting out the web of adhesive film along the outer periphery of said ring; and
- cutting means mounted on said cutter supporting frame for cutting the web of adhesive film transversely.

4,522,680

METHOD FOR PRODUCING CRYSTALS

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 15, 1983, Ser. No. 485,506
Claims priority, application Japan, Apr. 15, 1982, 57-63744; Oct. 19, 1982, 57-183959
Int. Cl.³ B01J *3/06*
U.S. Cl. 156—624 **11 Claims**



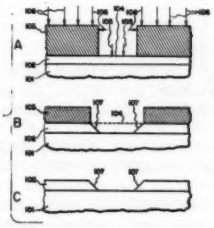
1. A method for producing crystals of a material which comprises the steps of:
- (a) providing a starting solid material capable of absorbing a laser beam energy;
- (b) completely surrounding said solid material with a substantially spherical body transparent to the energy such that said starting solid material is placed approximately at the center of said substantially spherical body as a nucleus;
- (c) applying the laser beam energy from outside of said substantially spherical body until said starting solid material is heated and melted whereby a high internal pressure is produced by thermal expansion of said starting solid material being melted and is imposed on the melt, said laser beam energy, when applied to a surface of said substantially spherical body in parallel beams, being focused on said starting solid material by said substantially spherical body to cause said starting solid material to be heated and melted; and
- (d) cooling the melt, thereby forming crystals different from the crystals of said starting solid material.

4,522,681

METHOD FOR TAPERED DRY ETCHING

Bernard Gorowitz, Clifton Park, and Richard J. Saia, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 23, 1984, Ser. No. 602,873
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **11 Claims**



1. A dry etching method which comprises the steps of:
- (A) forming on a substrate a positive mask having substantially vertical edges from a polymeric photoresist material capable of being isotropically eroded by plasma action;
- (B) contacting the masked substrate with a plasma under conditions producing both anisotropic etching of said substrate and controlled isotropic erosion of said mask, and continuing plasma contact until the desired end point

has been reached, thereby producing at least one tapered hole in said substrate.

4,522,682

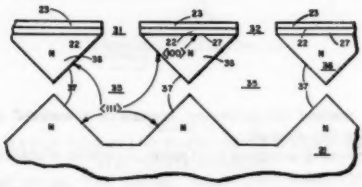
METHOD FOR PRODUCING PNP TYPE LATERAL TRANSISTOR SEPARATED FROM SUBSTRATE BY O.D.E. FOR MINIMAL INTERFERENCE THEREFROM

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 21, 1982, Ser. No. 390,496

Int. Cl.³ H01L *21/306, 29/72;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—647 **4 Claims**



1. A method for forming an array of sub-micron dimensioned PNP-type lateral transistors on a substrate doped N-type, wherein each transistor is formed comprising the following steps:

masking the substrate to outline a pair of boundary regions for each semi-array of active regions to become transistors;

slotting the substrate in said boundary regions to a given depth;

etching away the substrate via said slots sufficiently to separate the semi-arrays of active regions from the substrate except at spaced apart supporting locations therealong;

oxidizing the substrate and semi-arrays to at least substantially completely oxidize the peripheries of the semi-arrays;

slotting the substrate orthogonally to the first mentioned slots to provide second slots with orthogonal pairs of slots defining individual transistor active regions for the respective transistors;

doping the regions defined by orthogonal pairs of slots P+ via corresponding edges of the second slots and driving in the P+ doping; and,

establishing electrical connections to the outer P+ regions, and inner N region of the original substrate.

4,522,683

DISSOLUTION OF METALS UTILIZING TUNGSTEN-DIOL COMBINATIONS

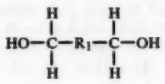
Moenes L. Elias, Canfield, and Walter L. Burger, Salem, both of Ohio, assignors to Plastic Specialties and Technologies, Inc., Barrington, Ill.

Filed Jan. 12, 1984, Ser. No. 570,056

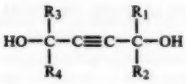
Int. Cl.³ C23F *1/00;* **B44C** *1/22*

U.S. Cl. 156—666 **21 Claims**

1. In a process for the dissolution of metal in which a metal is contacted with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid and from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, the method of increasing the metal dissolution rate of the solution, which method comprises adding an effective amount of a promoter composition comprising from about 5 to about 5000 parts per million of tungsten and from about 0.1 to 10% by weight of a diol selected from the group consisting of a primary diol having the general formula:

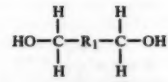


wherein R_1 is selected from: (a)—$(CR_2R_3)_n$—, where each R_2 and R_3 independently from each other is either hydrogen or an alkyl group of 1 to 4 carbon atoms, and n is at least 2, (b) a cycloparaffinic group or an alkyl-substituted cycloparaffinic group having from 5 to 7 carbon atoms in the ring structure and from 1 to 4 carbon atoms in any of the alkyl substitutions, (c) monohydroxy or dihydroxy-substituted cycloparaffins containing from 5 to 7 carbon atoms in the ring structure, and (d) monohydroxy or dihydroxy-substituted alkylcycloparaffins containing from 5 to 7 carbon atoms in the ring structure, where each of the alkyl groups contains from 1 to 4 carbon atoms and is attached to an unsubstituted carbon atom in the ring structure, and (e) a diol of the general formula:

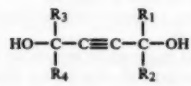


wherein R_1, R_2, R_3 and R_4 can be either H, CH_3, OC_2H_5 or OC_3H_8.

12. In a composition for metal dissolution comprising an aqueous solution of from about 0.2 to about 4.5 gram moles per liter of sulfuric acid and from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, the presence of an effective amount of a promoter composition comprising from about 5 to about 5000 parts per million of tungsten and from about 0.1 to 10% by weight of a diol selected from the group consisting of a primary diol having the general formula:



wherein R_1 is selected from: (a)—$(CR_2R_3)_n$—, where each R_2 and R_3 independently from each other is either hydrogen or an alkyl group of 1 to 4 carbon atoms, and n is at least 2, (b) a cycloparaffinic group or an alkyl-substituted cycloparaffinic group having from 5 to 7 carbon atoms in the ring structure and from 1 to 4 carbon atoms in any of the alkyl substitutions, (c) monohydroxy or dihydroxy-substituted cycloparaffins containing from 5 to 7 carbon atoms in the ring structure, and (d) monohydroxy or dihydroxy-substituted alkylcycloparaffins containing from 5 to 7 carbon atoms in the ring structure, where each of the alkyl groups contains from 1 to 4 carbon atoms and is attached to an unsubstituted carbon atom in the ring structure, and a diol of the general formula:



wherein R_1, R_2, R_3 and R_4 can be either H, CH_3, OC_2H_5 or OC_3H_8.

4,522,684

ELEVATIONAL OPERATING DEVICE FOR A ROTARY EVAPORATOR

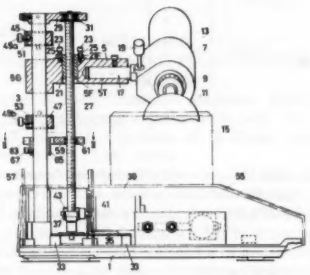
Tatsuhiko Saito, Machida, Japan, assignor to Yamato Scientific Co., Ltd., Japan

Filed Aug. 1, 1983, Ser. No. 519,039

Claims priority, application Japan, Oct. 15, 1982, 57-155089[U]; Oct. 15, 1982, 57-155091[U]; Oct. 15, 1982, 57-155092[U]; Feb. 10, 1983, 58-17465[U]; Feb. 10, 1983, 58-17466[U]

Int. Cl.³ B01D *1/30*

U.S. Cl. 159—11.2 **8 Claims**



1. Apparatus for elevatably supporting the unbalanced load of a rotary evaporator sample vessel in vertically elevatable relation alongside the supporting apparatus, comprising:

a pole substantially vertically mounted on a base;

a elevating member mounted for free vertical movement on said pole;

a rotatable operating rod substantially vertically mounted on said base in parallel relation to said pole;

a nut member mounted on said elevating member and operatively engaging said operating rod so as to impart vertical movement to the elevating member in response to rotation of the operating rod;

said elevating member including means to support a sample vessel in horizontal spaced relation to said operating rod, whereat the weight of the sample vessel acts as an unbalanced load on the operating rod; and

means designed for substantially precluding vibration and squeaking of said elevatable support apparatus while supporting an unbalanced load, including means operatively associated with said nut member and said elevating member to allow the nut member to undergo a limited amount of vertical motion reltive to the elevating member as the operating rod rotates.

4,522,685

METHOD OF OPERATING A SPENT PULPING LIQUOR COMBUSTION APPARATUS

Herman F. Feldmann, Worthington, Ohio, assignor to International Paper Company, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,237

Int. Cl.³ D21C *11/12*

U.S. Cl. 162—30.11 **7 Claims**

1. An integrated process for the recovery of energy and chemical values from spent pulping liquor which comprises an initial stage of subjecting spent pulping liquor concentrated to at least about 50% by weight solids content to combustion with air at temperatures from about 1100 deg. F. to about 1300 deg. F. in a fluidized-bed reaction chamber, said chamber providing:

(a) an entrained fluidized-bed in a first space region containing a first relatively fine solid bed particle consisting substantially of combustion residue salts of spent pulping liquor combustion in air;

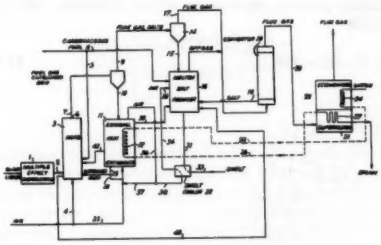
(b) in a second more limited space region within the first space region, a second relatively dense fluidized bed containing a relatively coarse solid bed particle component consisting substantially of combustion residue salts of spent pulping liquor combustion in air;

(c) a recirculation path for the first particle component from the first space region through the dense fluidized-bed in the more limited space region, wherein a portion of the fine particle solid is separated and removed from the upper portion of the reaction chamber, conveyed to and passed through a fluidized-bed containing heat-exchanger means for removing heat values from said separated and removed fine particle size solid, and said separated and removed fine particle size solid is subsequently reintroduced into the fluidized-bed reaction chamber below the surface of the relatively dense fluidized-bed;

(d) said first and second fluidized-beds containing a minimal quantity of particle sizes intermediate between the average particle size of said first fluidized-bed and the average particle size of said second fluidized-bed; and

(e) fluidizing air provided to fluidize said first and second fluidized-beds at a superficial velocity of from about 15 to about 30 feet per second.

6. An improved multiple solids fluidized-bed combustor adapted for subjecting spent pulping liquor to combustion with air in a fluidized bed reaction chamber provided with a plurality of solid particulate materials, said chamber providing:



(a) an entrained fluidized-bed in a first space region containing a first relatively fine solid bed particle;

(b) a second relatively dense fluidized-bed in a second more limited space region containing relatively coarse solid bed particles;

(c) a recirculation path for the first particle component from the first space region through the dense fluidizied-bed in the more limited space region wherein means are provided for removing a portion of the fine particle solids from the upper portion of the reaction chamber, conveying said removed solids to and passing said removed solids through a fluidized-bed containing heat-exchanger means for removing heat values from said removed solids and means for reintroducing said removed solids into the fluidized-bed reaction chamber below the surface of said second relatively dense fluidized-bed; and

(d) said first and second fluidized-beds containing a minimal quantity of particle sizes intermediate between the average particle size of said first fluidized-bed and the average particle size of said second fluidized-bed;

wherein the improvement comprises the particles of both the first and second fluidized-beds consisting substantially of combustion residue salts of the combustion of spent pulping liquor in air.

4,522,686

AQUEOUS SIZING COMPOSITIONS

David H. Dumas, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 302,010, Sep. 15, 1981, abandoned. This application Jul. 7, 1983, Ser. No. 511,445

Int. Cl.³ D21H 3/34

U.S. Cl. 162—158 10 Claims

1. As a composition of matter, a cationic aqueous dispersion having as the continuous phase an aqueous solution containing at least one water-soluble nitrogen-containing cationic dispersing agent and as the dispersed phase (a) finely divided particles of fortified rosin and (b) finely divided particles of a hydrophobic, cellulose-reactive ketene dimer sizing agent, the weight ratio of (a):(b) in said dispersed phase being within the range of 0.1:1 to 10:1, and the amount of dispersing agent being within the range of about 5 to about 140% based on the weight of the dispersed phase.

4,522,687

FLOW BOX WITH TWO DEFLECTORS

David L. Eynon; Stanley W. Kingsnorth, both of Cumbria, and Mani K. Varma, Essex, all of England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

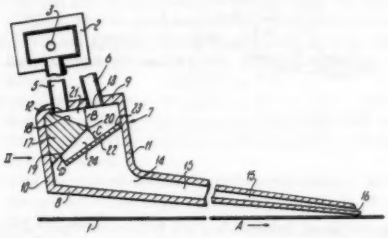
PCT No. PCT/GB82/00195, § 371 Date Jan. 20, 1983, § 102(e) Date Jan. 20, 1983, PCT Pub. No. WO83/00173, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 2, 1982, Ser. No. 463,868

Claims priority, application United Kingdom, Jul. 2, 1981, 8120468

Int. Cl.³ D21F 1/02, 1/04

U.S. Cl. 162—336 11 Claims



1. A flow box for a paper making machine comprising an explosion chamber having a base wall, a top wall and two side walls; an outlet at the bottom of one of the side walls adjacent the base wall communicating with a slice chamber extending parallel to the base wall; and a plurality of inlet pipes connecting the explosion chamber to a distribution chamber, the inlet pipes communicating with two rows of openings in the top wall of the explosion chamber and having an axial direction directed towards the base wall; a first deflector extending from one of said side walls, having an upper surface and a lower surface, the upper surface extending across the axial direction of the pipes of a first row of openings to form a divergent passage with the top wall in the direction of the second row of openings, and terminating at a distal edge outside of the axial direction of the pipes of the second row of openings; and wherein said upper surface of said first deflector does not extend across the axial direction of the pipes of the second row of openings; a second deflector extending from the other of said side walls across the axial direction of the pipes of the second row of openings, the second deflector having an upper surface forming a convergent flow passage with at least a part of the lower surface of the first deflector.

4,522,688

PROCESS FOR RECOVERY OF CYCLOPENTADIENES

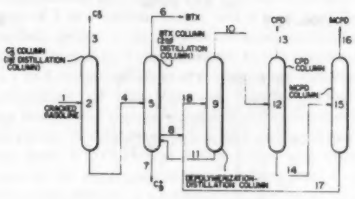
Akira Yokogawa, Kasukabe; Asao Takahashi, Omiya; Isao Maruyama, Chihara, and Takao Hosaka, Chiba, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,661

Claims priority, application Japan, Oct. 29, 1982, 57-190968

Int. Cl.³ B01D 3/14

U.S. Cl. 203—28 6 Claims



1. A process for recovering cyclopentadiene from a cracked gasoline fraction which comprises:

feeding a cracked gasoline fraction which is formed as a by-product in the thermal or steam cracking of a liquid hydrocarbon to a benzene-toluene-xylene distillation column which provides benzene, toluene, and xylene as the overhead stream;

withdrawing the internal reflux stream from the stripping section of said distillation column and feeding said withdrawn internal reflux stream to a depolymerization-distillation column in which said stream is depolymerized by heating at 160°–230° C. for 10–200 minutes;

withdrawing the bottom stream from the depolymerization-distillation column and feeding it into said benzene-toluene-xylene distillation column at a position which is situated below the position from which said internal reflux stream is withdrawn;

withdrawing an overhead stream from said depolymerization-distillation column and feeding it to a cyclopentadiene distillation column which is operated at a bottom temperature of 160°–230° C. with a residence time of 0.25–6 hours, and at an overhead pressure of 0–2 Kg/cm^2-G, and at an overhead temperature of 35°–80° C. wherein said cyclopentadiene is distilled as the overhead; and

withdrawing said distilled cyclopentadiene from the overhead of said cyclopentadiene column.

4. A process for recovering cyclopentadiene and methylcyclopentadiene from a cracked gasoline fraction which comprises:

feeding a cracked gasoline fraction which is formed as a by-product in the thermal or steam cracking of a liquid hydrocarbon to a benzene-toluene-xylene distillation column which provides benzene, toluene, and xylene as the overhead stream;

withdrawing the internal reflux stream from stripping section of said distillation column and feeding said withdrawn internal reflux stream to a depolymerization-distillation column in which said stream is depolymerized by heating at 170°–230° C. for 10–200 minutes;

withdrawing the bottom stream from the depolymerization-distillation column and feeding it into said benzene-toluene-xylene distillation column at a position which is situated below the position from which said internal reflux stream is withdrawn;

withdrawing an overhead stream from said depolymerization-distillation column and feeding it to a cyclopentadiene distillation column which is operated at a bottom temperature of 160°–230° C. with a residence time of 0.25–6 hours, and at an overhead pressure of 0–2 Kg/cm^2-G, and at an overhead temperature of 35°–80° C.

wherein said cyclopentadiene is distilled as the overhead; and

withdrawing said distilled cyclopentadiene from the overhead of said cyclopentadiene column;

withdrawing the bottom stream from the cyclopentadiene distillation column and feeding it to a methylcyclopentadiene distillation column which is operated at a bottom temperature of 170°–210° C. with a residence time of 0.5–5 hours, and at an overhead pressure of 0–2 Kg/cm^2-G and at an overhead temperature of 65°–115° C. wherein methylcyclopentadiene is distilled as the overhead; and

withdrawing said distilled methylcyclopentadiene from the overhead of said methylcyclopentadiene distillation column.

4,522,689

PROCESS FOR PURIFYING PHOSPHONITRILE CHLORIDES

Hiroshi Tanino, Hasuda; Tetsuhiko Okamoto, Tokyo; Shinichiro Ueyama, Tokyo; Kazuhiko Fujikawa, Tokyo, and Takatoshi Tsumiyama, Toyonaka, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Japan

Continuation of Ser. No. 460,261, Jan. 24, 1983,. This application Oct. 9, 1984, Ser. No. 658,543

Claims priority, application Japan, Jan. 29, 1982, 57-11765

Int. Cl.³ B01D *3/34;* **C01B** *25/10*

U.S. Cl. 203—52 **1 Claim**

1. A process for completely separating tri(phosphonitrile chloride) from tetra(phosphonitrile chloride) and/or phosphonitrile chloride oligomer $(NPCl_2)_m$, wherein a mixture of tri(phosphonitrile chloride) of the formula:

$(NPCl_2)_3$

and tetra(phosphonitrile chloride) of the formula:

$(NPCl_2)_4$

and/or phosphonitrile chloride oligomer of the formula:

$(NPCl_2)_m$

(wherein m represents an integer of 5 or greater), together with an inert organic solvent selected from the group consisting of mixtures of normal- or iso-paraffinic hydrocarbons, mixtures of monocyclic aromatic hydrocarbons, mixtures of polycyclic aromatic hydrocarbons; and combinations of mixtures of mono- and poly-cyclic aromatic hydrocarbons, said mixtures having a boiling point from 200° to 400° C., wherein the mixture is subjected to distillation under reduced pressure at a temperature below the boiling point of tetra(phosphonitrile chloride) at said reduced pressure, thereby to distill out in the distillate a mixture of only tri(phosphonitrile chloride) and the solvent.

4,522,690

ELECTROCHEMICAL SENSING OF CARBON MONOXIDE

Hanumanthaiya V. Venkatasetty, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 1, 1983, Ser. No. 557,072

Int. Cl.³ G01N *27/46*

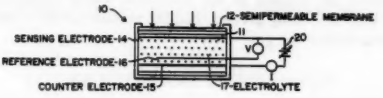
U.S. Cl. 204—1 T **17 Claims**

1. A method for detecting the presence of a plurality of toxic agents comprising the steps of:

providing electrochemical cell means having an electrode configuration comprising a plurality of electrodes including a platinum working electrode, a platinum counter electrode and an Ag/Ag^+ reference electrode;

providing a nonaqueous gelled aprotic electrolyte solution in the electrochemical cell means, said solution comprising an aprotic organic solvent selected from the group consisting of γ-butyrolactone and propylene carbonate, an amount of lithium perchlorate electrolyte and polyethylene oxide gelling agent;

exposing the electrochemical cell means to an atmosphere suspected of containing the gas of interest;



providing electrical source means and connecting the source means to the electrode configuration to energize the cell means; and

providing means for measuring the current flowing between said sensing electrode and said counter electrode.

4,522,691

METHOD FOR MANUFACTURING A MULTICOLOR FILTER AND A MULTICOLOR DISPLAY DEVICE

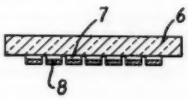
Mitsuru Suginoya; Koji Iwasa; Hitoshi Kamamori; Yutaka Sano, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,947

Claims priority, application Japan, Dec. 22, 1982, 57-233933; Dec. 22, 1982, 57-233934; Apr. 12, 1983, 58-64117

Int. Cl.³ C25D *13/02, 13/06*

U.S. Cl. 204—18.1 **50 Claims**



1. A method for manufacturing a color filter comprising the steps of: forming a conductive thin film layer having a given pattern on an electrically insulative substrate; and forming a colored layer on said conductive thin film layer by co-electrodepositing a coloring material and polymer on said conductive thin film layer.

4,522,692

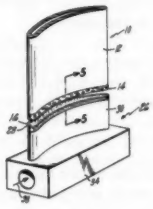
ELECTROCHEMICAL MACHINING A WORKPIECE UNIFORMLY USING A POROUS ELECTRODE

Frederick R. Joslin, Lebanon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1983, Ser. No. 517,315

Int. Cl.³ B23P *1/14, 1/00;* **C25F** *7/00*

U.S. Cl. 204—129.5 **7 Claims**



6. The process of electrochemically machining a workpiece to remove material uniformly therefrom, wherein an electrode has a working face spaced apart by a gap from the workpiece surface and wherein electrolyte is flowed under pressure

through the electrode working face and then through the gap, characterized by an electrode working face made of a porous powder metal filter element material having a filtration rating in the range of 20–100$\times 10^{-6}$ m and by flowing the electrolyte through said working face, the pressure drop of the electrolyte through the portion of the electrode which comprises the working face being greater than the pressure drop of the electrolyte within the gap.

4,522,693

PHOTOPOLYMERIZABLE COMPOSITION WITH ACYLPHOSPHINE SULFIDE PHOTOINITIATOR AND METHOD

Andreas Henne, Ludwigshafen; Anton Hesse, Luetzelsachsen; Guenter Heil, Ludwigshafen, and Gunnar Schornick, Neuleiningen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

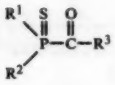
Continuation of Ser. No. 296,895, Aug. 27, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 500,429

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, 3034697

Int. Cl.³ C08F *2/50*

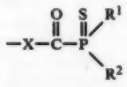
U.S. Cl. 204—159.15 **13 Claims**

12. A photopolymerizable composition comprising monomers having polymerizable C—C double bonds and as a photoinitiator an acylphosphine sulfide of the formula



(I)

where R^1 is straight-chain or branched alkyl of 1 to 6 carbon atoms, cyclohexyl or cyclopentyl, or a phenyl, naphthyl or O—, S— or N—containing 5- or 6-membered heterocyclic radical which is unsubstituted or substituted by fluorine, chlorine, bromine, C_1–C_4—alkyl or C_1–C_4—alkoxy; R^2 has the meanings of R^1 and can be identical to or different from R^1, or is alkoxy of 1 to 6 carbon atoms, phenoxy which is unsubstituted or substituted by chlorine, C_1–C_6—alkyl or C_1–C_6—alkoxy, or phenoxyalkyl, where alkyl is of 1 to 4 carbon atoms, or R^1 and R^2 are linked together to form a ring of 4 to 10 carbon atoms which is unsubstituted or can contain 1 to 6 further alkyl substituents, each of 1 to 4 carbon atoms, as well as 1 or 2 fused-on benzene rings; R^3 is straight-chain or branched alkyl of 2 to 18 carbon atoms, a cycloaliphatic radical of 3 to 12 carbon atoms, mono-, di-, tri- or tetra-substituted phenyl or an unsubstituted or mono-, di-, tri- or tetra-substituted naphthyl, where the substituents can be identical or different and can be alkyl, alkylthio or alkoxy of 1 to 6 carbon atoms or chlorine, bromine or fluorine, or the group



where R^1 and R^2 have the above meanings and X is unsubstituted or mono-, di-, tri- or tetra-substituted phenylene, where the substituents can be identical or different and can be alkyl, alkylthio or alkoxy of 1 to 6 carbon atoms or halogen of atomic weight of not more than 80, or X is an aliphatic or cycloaliphatic divalent radical of 2 to 6 carbon atoms; and where one or more of R^1, R^2 and R^3 may be olefinically unsaturated, where R^3 can also be methyl or phenyl.

4,522,694

PROCESS FOR THE PHOTOPOLYMERIZATION OF VINYL COMPOUNDS AND PHOTOPOLYMERIZABLE MATERIALS USED IN SAID PROCESS

Roland Schaefer, Friedrichsdorf, Fed. Rep. of Germany, assignor to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,371

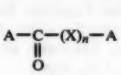
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301011

Int. Cl.³ C08F *2/46, 4/00*

U.S. Cl. 204—159.24 **29 Claims**

1. In a method for the production of a polymer composition comprising photopolymerizing at least one vinyl compound in the presence of a photoinitiator, the improvement comprising polymerizing said at least one vinyl compound in the presence of a photoinitiator comprising:

(a) at least one photosensitizer of the formula



wherein

X is selected from the group consisting of CO, $C(R^1)$ (R^2) and $C(R^3)(OR^4)$, wherein R^1, R^2, R^3, R^4 are each selected from the group consisting of hydrogen and a hydrocarbon radical;

n is 0 or 1; and

A are hydrocarbon radicals which may be substituted and which may be bonded together with the proviso that when n is 1 and X is $C(R^1)(R^2)$, and when n is 0, A is an aromatic radical; and

(b) at least one reducing agent selected from the group consisting of N-alkyl-pyrazole, N-alkyl-triazole, N-alkyl-tetrazole, N-aryl-benzotriazole, N-aryl-pyrazole, N-aryl-tetrazole, and N-aryl-triazole.

4,522,695

VAPOR PHASE HYDROGEN GENERATOR

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 440,080, Dec. 23, 1982, Pat. No. 4,472,260. This application Apr. 30, 1984, Ser. No. 605,398

Int. Cl.³ C25B *1/10, 9/00;* **H01M** *6/34*

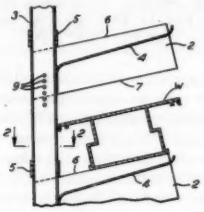
U.S. Cl. 204—266 **3 Claims**

3. A hydrogen and oxygen generator having a plurality of light absorbing semiconductor receptors supported in a hydrophilic foam, a liquid to solid junction is formed between the light absorbing semiconductors and water supplied by water vapor contained in the hydrogen and oxygen generator said light receptors being capable of producing an electrical current when activated by light, and providing hydrogen and oxygen by the decomposition of water by electrolysis, the generated hydrogen and oxygen are removed from the generator by passing through a gas permeable membrane.

4,522,696
CARRIER FOR MATERIAL DURING ELECTROLYTIC FINISHING

Edward P. Short, Addisbury, and Gerald Bernardo, Banbury, both of England, assignors to Alcan International Limited, Montreal, Canada

Filed Apr. 8, 1983, Ser. No. 483,121
Claims priority, application United Kingdom, Apr. 14, 1982, 8210858
Int. Cl.³ C25D *17/04*
U.S. Cl. 204—297 W **5 Claims**

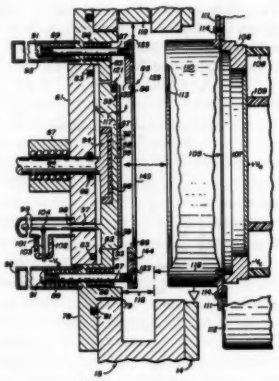


1. A carrier for supporting extended lengths of metal during electrolytic finishing treatments comprising a flight bar supporting at least two dependent spline members, each spline member carrying at least one series of vertically spaced support arms in electrical connection with it and having an associated vertically slideable clamp bar, carrying a series of vertically spaced spring clamp members arranged at substantially the same interval as the support arms on the spline and each arranged for clamping a workpiece in electrical contact with a surface on an adjacent support arm.

4,522,697
WAFER PROCESSING MACHINE

Jack A. Dimock, and Peter J. Clarke, both of Santa Barbara, Calif., assignors to Sputtered Films, Inc., Santa Barbara, Calif.

Filed Dec. 22, 1983, Ser. No. 564,740
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **12 Claims**



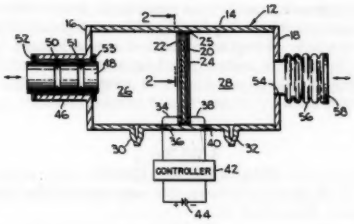
1. In a method for precisely locating the position of wafers within their respective carrying slots of a wafer carrier cassette of the type having slotted side walls for retaining an array of wafers in axially aligned an axially spaced relation and having an opening in the bottom and top of said wafer carrier for passage of a wafer pickup blade therethrough for moving wafers into and out of said wafer carrier, the step of:

inserting and indexing means with a precisely determined pitch through the open bottom of said wafer carrier to pick up and position the bottom edge of said wafers within respective ones of said slots within said wafer carrier, whereby movement of said wafers by said blade is fecilitated in use.

4,522,698
ELECTROCHEMICAL PRIME MOVER

Henri J. R. Maget, 80 Arbuelo Way, Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 320,552, Nov. 12, 1981, Pat. No. 4,402,817. This application Aug. 30, 1983, Ser. No. 527,698
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—301 **4 Claims**



1. A prime mover comprising means defining a gas-tight chamber, an electrolytic membrane disposed in said chamber, said membrane having a first membrane surface and a second membrane surface spaced from said first membrane surface in substantial parallelism thereto, said membrane being fixed within said chamber so as to form at least a first compartment bounded in part by said first membrane surface, a first material-pervious electrode disposed on said first membrane surface and a second material-pervious electrode disposed on said second membrane surface, said first compartment containing an electrochemically active material capable of existing in a gaseous phase and being electrochemically reversibly active so as to enter into a reduction/oxidation reaction at said first and second material-pervious electrodes and produce ions that are transportable through said electrolytic membrane, means connected to said first and second material-pervious electrodes for inducing unidirectional current flow therebetween through said electrolytic membrane so as to ionize said electrochemically active material at one said material-pervious electrode and transport ions through said electrolytic membrane from said second membrane surface to said first compartment thereby effecting a pressure increase in said first compartment, and converting means operatively associated with said first compartment for converting the pressure change therein to mechanical motion.

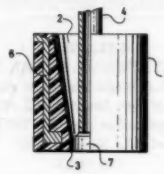
4,522,699
INDICATOR TERMINAL FOR COULOMETRIC MEASURING DEVICES

Václav Novák; Jaroslav Prusek, and Václav Trojan, all of Prague, Czechoslovakia, assignors to Statni Vyzkumny Ustav Ochrany Materialu G.V., Prague, Czechoslovakia

Filed Jun. 21, 1982, Ser. No. 390,696
Claims priority, application Czechoslovakia, Jun. 29, 1981, 4956-81
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—434 **7 Claims**

1. An indicator terminal for a coulometric measuring device comprising, a rigid tubular terminal body having opposite end portions, a tubular nozzle entering one end portion of said terminal body and defining therewith an annular chamber, said nozzle having a terminus within said body ending a predeter-

mined distance before the opposite end portion of said body, said terminal body having a distortion free contact mouth opening formed at said opposite end portion for sealing and engaging a surface to be measured, said mouth opening extending inwardly from the opposite end portion toward the terminus of said nozzle to receive an electrolytic solution from said nozzle, said mouth opening having a diameter greater than the outside diameter of said terminus, and means located in said annular chamber for centering and supporting the terminus of said tubular nozzle in said body and promoting laminar fluid flow in said mouth portion and said annular chamber.



4,522,700

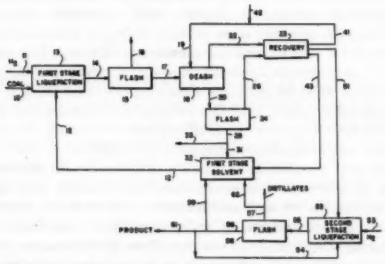
COAL LIQUEFACTION

Harvey D. Schindler, Fairlawn, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 531,952, Sep. 14, 1983, abandoned, which is a continuation of Ser. No. 290,246, Aug. 5, 1981, abandoned. This application Aug. 13, 1984, Ser. No. 640,235

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—8 LE **13 Claims**



1. In a process for the two-stage liquefaction of coal wherein coal is liquefied in a first stage thermal liquefaction zone with a first stage liquefaction solvent to produce a first effluent; first effluent is deashed to recover an essentially ash free liquid and a pumpable stream consisting essentially of insoluble material and 850° F.+ liquid; essentially ash free 850° F.+ liquid is recovered from the first effluent and contacted with hydrogen in a second stage to upgrade the essentially ash free liquid and produce a second effluent, 850° F.+ liquid is recovered from the second effluent; and 850° F.− liquid having an initial boiling point of at least 500° F. is recovered from the first and second effluent, the improvement comprising:

said first stage liquefaction solvent consisting essentially of a portion of the pumpable stream recovered from the first effluent, a portion of 850° F.+ liquid which is recovered from the second stage effluent and directly utilized in the liquefaction solvent (without additional hydrogenation) and 850° F.− liquid having an initial boiling point of at least 500° F. recovered from both the first and second effluents and directly utilized in the liquefaction solvent (without additional hydrogenation), said first stage liquefaction solvent consisting essentially of 15% to 50% of 850° F.+ liquid, 5% to 20% of insoluble material and at least 45% of 850° F.− liquid having an initial boiling point of at least 500° F., with at least 10% of said first stage liquefaction solvent being obtained from said pumpable stream and at least 25% of the first stage liquefaction solvent being 850° F.+ liquid obtained from the second stage liquid effluent, said first stage liquefaction solvent providing the solvent requirements for the first stage liquefaction.

4,522,701

PROCESS FOR PREPARING AN ANISOTROPIC AROMATIC PITCH

Ghazi B. Dickakian, Greenville, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 11, 1982, Ser. No. 348,029

Int. Cl.³ C10C *3/00*

U.S. Cl. 208—40 **14 Claims**

1. A process of preparing an aromatic pitch which produces a carbon product with an anisotropic structure comprising: heat-treating a pitch containing 1–15% toluene insolubles produced from a catalytic cracking residue, at 410° to 500° C. for a period of time less than about 120 minutes at atmospheric or reduced pressure effective to obtain a toluene insoluble level of at least 30% by weight of the pitch while minimizing the quinoline insolubles to less than 3% by weight of the pitch; and then stripping the distillable oil from the pitch.

4,522,702

DEMETALLIZATION OF HEAVY OILS WITH PHOSPHOROUS ACID

Simon G. Kukes, and David R. Battiste, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 27, 1984, Ser. No. 655,113

Int. Cl.³ C10G *45/00, 17/00*

U.S. Cl. 208—89 **24 Claims**

1. A process for treating a feed stream which contains hydrocarbons and metals comprising contacting said feed stream under suitable conditions with an amount of phosphorous acid sufficient to convert at least a portion of said metals to compounds which are substantially insoluble in said hydrocarbon feed stream.

4,522,703

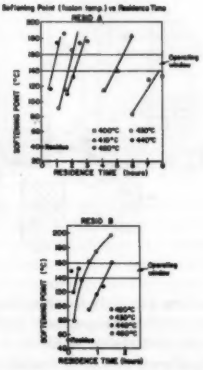
THERMAL TREATMENT OF HEAVY HYDROCARBON OIL

Tsoung Y. Yan, Philadelphia, Pa., and Nai Y. Chen, Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 281,159, Jul. 8, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 554,013

Int. Cl.³ C10C *3/00*; C10G *9/14*

U.S. Cl. 208—106 **13 Claims**



1. A process for upgrading heavy hydrocarbon oil by ther-

mal treatment which comprises (1) heating heavy hydrocarbon oil at a temperature between about 425°–550° C. and a pressure between about 100–2000 psi for a soak period between about 0.05–2 hours at the highest Severity in the range between about 700–2000 seconds, as expressed in equivalent reaction time at 800° F., sufficient to convert at least about 50 weight percent of the heavy hydrocarbon oil to gasoline and gas oil range hydrocarbons, substantially without the formation of solid coke; and (2) recovering separate fractions of gasoline and gas oil, and residual tar which has a fusion temperature below about 160° C. and a quinoline-insoluble content between about 20–50 weight percent; wherein the highest Severity in step(1) is determined by a functional relationship between the asphaltene content of the heavy hydrocarbon oil and the residual tar yield and residual tar quinoline-insoluble content in accordance with the following equation:

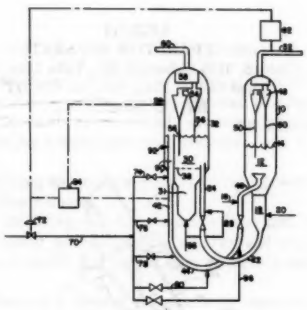
$$\text{wt \% asphaltenes} \cdot \frac{\text{wt \% tar quinoline} - \text{insolubles}}{\text{wt \% tar yield}} = 6\text{–}12$$

4,522,704

PASSIVATION OF CRACKING CATALYSTS

Carl F. Bertsch, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 9, 1983, Ser. No. 559,891
Int. Cl.³ C10G *11/00*
U.S. Cl. 208—113 **17 Claims**



1. A method for passivating cracking catalyst in a cracking system comprising a reaction zone, a regeneration zone, and a passivation zone, said method comprising:

(a) passing feedstock containing a metal contaminant selected from the group consisting of nickel, vanadium, iron and mixtures thereof into the reaction zone maintained under reaction conditions having cracking catalyst therein, coke and metal contaminant becoming deposited on the cracking catalyst;

(b) passing cracking catalyst from the reaction zone to the regeneration zone maintained under regeneration conditions wherein at least a portion of the coke is removed from the catalyst;

(c) passing metal contaminated cracking catalyst from the regeneration zone through the passivation zone maintained under reducing conditions prior to returning the cracking catalyst to the reaction zone; and,

(d) adding a passivation promoter to the cracking system, the passivation promoter selected from the group of metals consisting of cadmium, germanium, indium, tellurium, zinc, compounds thereof and mixtures thereof.

4,522,705

OCTANE ENHANCEMENT AND TOTAL LIQUID PRODUCT YIELD IMPROVEMENTS IN CATALYTIC CRACKING USING IN-SITU CRYSTALLIZED ZSM-5 CLAY AGGREGATES

Pochen Chu, West Deptford, and Gary M. Pasquale, Sewell, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 13, 1984, Ser. No. 620,283
Int. Cl.³ C10G *11/05*
U.S. Cl. 208—120 **13 Claims**

1. In a process for catalytic cracking of a petroleum fraction under cracking conditions in the presence of a conventional cracking catalyst comprising a large pore crystalline zeolite and a matrix and an additive catalyst comprising a zeolite characterized by a Constraint Index of about 1–12 and a silica to alumina mole ratio greater than about 5 in an amount which provides the zeolite component of said additive catalyst at from about 1 to about 50 wt. percent of the conventional cracking catalyst, said catalysts coming into contact with steam at elevated temperatures, the improvement wherein said additive catalyst is prepared by in-situ crystallization of a clay aggregate.

4,522,706

HYDROCARBON TREATING PROCESSES USING PEROVSKITE-CONTAINING CATALYTIC COMPOSITIONS

Kenneth S. Wheelock, and Robert C. Schucker, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 388,900, Jun. 16, 1982, abandoned. This application Dec. 23, 1983, Ser. No. 564,843
Int. Cl.³ C10G *11/04, 11/18*
U.S. Cl. 208—121 **10 Claims**

1. A fluid coking process which comprises contacting a hydrocarbonaceous feed having a Conradson carbon ranging from about 5 to about 50 weight percent at fluid coking conditions with a catalyst comprising a composition comprising at least about 60 weight percent perovskite and less than about 99 weight percent of a perovskite ABO_3, and a non-perovskite reaction residue, wherein A is a cation of at least one metal, wherein B is a cation different from said cation A of at least one metal, said perovskite comprising at least one transition metal cation selected from the group consisting of elements having atomic numbers ranging from 21 through 30, through 39 through 48, from 57 through 80, and from 89 through 90, said composition having been prepared by reacting a component A comprising said cation A and a component B comprising said cation B at a temperature ranging from about 600° to about 2000° C. and for a time sufficient to form said perovskite ABO_3 and interrupting said reaction after formation of at least about 60 weight percent perovskite and before the formation of more than about 99 weight percent of said perovskite ABO_3, based on the weight of said component A plus component B whereby the remainder of said composition is a non-perovskite residue resulting from said reaction.

4,522,707

METHOD FOR PROCESSING USED OIL

Ernst Kriegel, and Hubert Coenen, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 95,100, Nov. 16, 1979, abandoned. This application Jan. 20, 1984, Ser. No. 572,543
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850540
Int. Cl.³ C10M *11/00*
U.S. Cl. 208—180 **10 Claims**

1. A method for processing a used oil which comprises about 70 percent by weight spindle and neutral oils, about 5 percent by weight lower and higher boiling point oils, about 10 percent

by weight useful additives and oxidation products, about 10 percent by weight water, about 5 percent by weight difficultly volatile and nonvolatile hydrocarbons, and solid impurities, wherein substantially all oils and useful additives are recovered in almost quantitative amounts without cracking or polymerization, comprising:

(a) dewatering the used oil;

(b) contacting the dewatered used oil with gas in a supercritical state said gas having a critical temperature between about 10° C. and 300° C., at a temperature above the critical temperature and at a pressure from its critical pressure up to about 350 bar, to form (1) a gaseous extraction phase containing the spindle and neutral oils and the additives, the spindle and neutral oils and substantially all the useful additives being extracted into the gaseous extraction phase during the contact with the supercritical gas and (2) an extraction residue;

(c) separating the gaseous extraction phase from the extraction residue; and

(d) separating the extracted spindle and neutral oils and the extracted additives from the gaseous extraction phase obtained in step (c) by changing the thermodynamic state of the gaseous extraction phase.

4,522,708

CATALYTIC REFORMING PROCESS EMPLOYING REFORMING CATALYSTS WHICH ARE BASED ON TUNGSTEN AND MOLYBDENUM CARBIDES

Lucien Leclercq, Villeneuve D'Asq, and Marcelle Provost, Poitiers, both of France, assignors to Eruotungstene-Poudres, Grenoble, France

Filed Mar. 15, 1984, Ser. No. 589,683

Claims priority, application France, Mar. 25, 1983, 83 05480

Int. Cl.³ C01G *35/06*

U.S. Cl. 208—136 **6 Claims**

1. In a process for reforming petroleum products by the catalysis of dehydrocyclization, isomerization, hydrogenolysis and dehydrogenation reactions, the improvement wherein the catalysts employed comprise a carbide corresponding to the formula:

$(Mo_xW_{1-x})_yC_z$ wherein $0<x<1$, $1\leq y\leq 2$ and $0.8\leq z\leq 1$, and said catalysts are initially nitrided at about 1,023 K. in a mixture of N_2 and H_2 before use.

4,522,709

CATALYTIC HYDRODESULFURIZATION OR HYDRODENITROGENATION

Arthur W. Aldag, Jr., and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 27, 1984, Ser. No. 644,883

Int. Cl.³ C10G *45/08*

U.S. Cl. 208—216 R **13 Claims**

1. A process for the catalytic hydrodesulfurization of an organic sulfur compound or the catalytic hydrodenitrogenation of an organic nitrogen compound comprising the step of contacting a fluid feed stream containing an organic sulfur compound or an organic nitrogen compound under suitable conditions with a hydrogel derived catalyst comprising zinc titanate and alumina promoted with cobalt and molybdenum.

4,522,710

METHOD FOR INCREASING DEASPHALTED OIL PRODUCTION

Biddanda U. Achia, Sarnia, Canada; David H. Shaw, Baton Rouge, La., and James D. Bushnell, Berkeley Heights, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 9, 1983, Ser. No. 559,736

Int. Cl.³ C10C *3/06, 3/08*

U.S. Cl. 208—349 **15 Claims**

1. A method for increasing the production of deasphalted oil from a hydrocarbon feedstock, said method comprising:

A. passing the feedstock into a first distillation column wherein the feedstock is separated into a first distillate and a first residuum;

B. passing between about 20 and about 60 weight percent of the total first residuum produced into a second, separate distillation column wherein the first residuum is separated into a second distillate and a second residuum; and

C. passing at least a fraction of the remaining first residuum and second distillate into a deasphalting zone wherein the residuum and second distillate are contacted with solvent to produce a deasphalted oil extract and an asphaltenic raffinate.

4,522,711

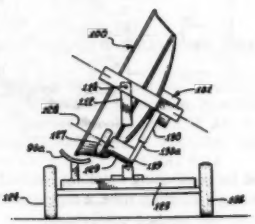
ORE SEPARATOR APPARATUS

Keith B. Cleland, 3189 Industrial Dr., Yuba City, Calif. 95991

Filed Oct. 6, 1983, Ser. No. 539,717

Int. Cl.³ B03B *5/74*

U.S. Cl. 209—298 **17 Claims**



1. In apparatus of the character described, the combination comprising

(a) a rotary bowl having rotary surfaces for separating particles of flowable solid material received into the bowl, the bowl having a first axis of rotation,

(b) first support means mounting the bowl for selective tilting about a second axis, there being a discharge ring at the rear of the bowl and connected therewith, the bowl having an axial opening associated with said ring for discharging said material, said first support means including a shaft extending through said opening and centered axially in the ring, the ring connected to the shaft, and

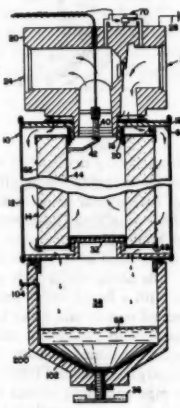
(c) drive means including a drive rotor suspended by said support means to be tilted with the bowl and engaging a bowl outer surface facing away from said axis for rotating the bowl, and a prime mover operatively connected with said drive rotor.

4,522,712

DOUBLE-ENDED, SPIN-ON FUEL WATER SEPARATOR

Paul M. Fischer, Menomonie, Wis., and Carl E. Schwarz, Burnsville, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 18, 1983, Ser. No. 543,118
The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.
Int. Cl.³ B01D 35/18
U.S. Cl. 210—86 8 Claims



1. A fuel-water separator having a spin-on filter cartridge, said cartridge having a filter element attached at a first and a second surface within an electrically grounded housing, said housing including a separated water reservoir, said separator comprising:

means supplying an electrical potential from a power source to said filter element;

means for insulating said filter element from said housing, said insulating means located at said first and said second surfaces of attachment of said filter element to said housing;

means indicating a current flow through separated water within said reservoir between said filter and said housing; and means for warning the contents of said separated water reservoir, said warming means located at said reservoir;

a head, including means for supplying a mixture of fuel and water into said separator, upstream from said filter element;

means for discharging separated fuel from said separator downstream from said filter element, said head threadably engaging said spin-on filter cartridge, said discharging means including a passageway having an electrical contact affixedly suspended within said passageway, said contact insulated from said head and electrically connected to said power source; and

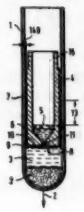
means for electrically connecting said filter element and said electrical contact when said filter cartridge is threadably engage to said head, said electrically connecting means including a spring arm having a contact point, said arm affixed to said filter element near said first surface of attachment of said filter element to said housing, said spring arm extending into said passageway and contacting said electrical contact.

4,522,713

APPARATUS FOR STATIC MEMBRANE FILTRATION

Dietmar Nussbaumer; Horst Perl, and Khuong T. Vinh, all of Göttingen, Fed. Rep. of Germany, assignors to Sartorius GmbH, Gottingen, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 555,636
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243864
Int. Cl.³ B01D 33/00, 35/02
U.S. Cl. 210—136 17 Claims



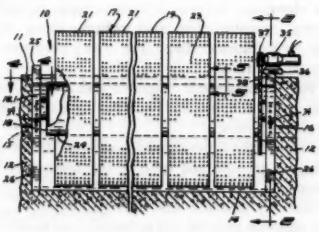
1. In a filtration apparatus for static membrane filtration of liquids, including an outer vessel comprising a centrifuge tube containing a liquid medium to be filtered, and having an open top and a closed bottom, and a filter unit provided with a filter element disposed in the liquid medium within said tube, the medium to be filtered being under excess pressure and in contact with said filter element of the filter unit, the improvement which comprises the filter unit having means defining an open upper end and a portion thereof at said upper end is reduced in wall thickness for storing rising liquid medium, means defining an unsealed gap or clearance situated between the filter unit and said centrifuge tube, and a filter membrane being disposed on the outside of the filter unit facing the bottom of said tube, the membrane having an edge and being sealed around said edge, and having a filtration active layer pointing outwardly thereof for filtering the medium so as to allow a filtrate thereof to collect in the filter unit.

4,522,714

WATER TREATMENT APPARATUS

Christopher P. Thissen, Austin, Minn., assignor to Walker Process Corporation, Aurora, Ill.

Filed Nov. 16, 1983, Ser. No. 552,264
Int. Cl.³ C02F 3/06
U.S. Cl. 210—150 12 Claims



1. Waste water treating apparatus comprising

a tank having an inlet and an outlet and having end and side walls confining the waste water to a predetermined depth in the tank,

a rotary biological contactor in the tank and having a rigid and hollow shaft extending horizontally and also having a water treating plastic media on the shaft to rotate thereon, the media peripherally embracing the shaft and having a

multiplicity of gas and water passages alternately filled and purged of gas and water as the media revolves,

the hollow shaft having closed ends in the tank and confronting the tank end walls and also having buoyancy for floating the entire rotary biological contactor in the waste water and with the shaft submerged,

means for rotating the biological contactor in the tank

and mechanical supports in fixed relation to the tank end walls and having connections to and engaging the ends of the shaft in the tank and at a submerged location therein, the mechanical supports adding upward vertical support to the buoyancy of the shaft to locate the top of the shaft periphery adjacent the surface of the water, whereby to maximize the treating function of the media as substantially all of the passages are filled and purged of water and gas in each revolution, and to neutralize a maximum portion of the weight of the media while minimizing the tendency of the shaft to flex.

4,522,715

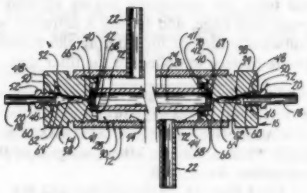
HIGH PERFORMANCE CHROMATOGRAPHY COLUMN

Rodney R. Walters, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 495,646, May 18, 1983, abandoned. This application Aug. 14, 1984, Ser. No. 640,925

Int. Cl.³ B01B *15/08*

U.S. Cl. 210—198.2 **13 Claims**



1. A chromatography column adapted to be used in high performance liquid chromatography comprising:

(a) an elongated hollow tubular column of rigid material having opposite ends, said column being of generally uniform cylindrical shape free of any permanently affixed threads or fittings;

(b) a pair of oppositely disposed end fittings each having inner and outer ends and each having elongated longitudinal passageways;

(c) the longitudinal passageways of said fittings each terminating in an enlarged bore at the respective inner ends thereof;

(d) a first ring means in said enlarged bores;

(e) the opposite ends of said column being positioned within said bores in abutting relation to said first ring means;

(f) an outer tubular sleeve positioned longitudinally around said column; and

(g) means for securing said end fittings to opposite ends of said sleeve so that said column and first ring means are axially compressed between said pair of secured end fittings with said first ring means being kept in a sealing compressed relationship between said end fittings and said opposite ends of said column.

4,522,716

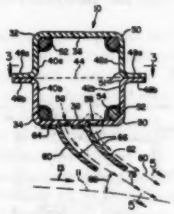
SHOWER PIPES FOR ROTARY DRUM FILTER

Richard W. LaValley, 15512 NE. 28th Ave., Vancouver, Wash. 98665

Filed Feb. 4, 1983, Ser. No. 464,023

Int. Cl.³ B01D *33/38*

U.S. Cl. 210—210 **19 Claims**



1. A shower pipe for a rotary drum filter comprising:

a rigid elongate pipe for spanning the length of a filter drum, said pipe being of rectangular cross section;

means defining a first row of spray holes extending in spaced apart relationship axially along said pipe, the holes extending through an outer wall of the pipe for discharging a first liquid spray line along the length of the pipe when said pipe is filled with a liquid under pressure;

means defining a second row of said spray holes extending in spaced apart relationship parallel to said first row, the second row being in the same quadrant of said pipe as the first row, for discharging a second liquid spray line along the length of the pipe and close to said first line; and

a pair of diffusion flange means depending from the pipe, one flange means extending lengthwise of the pipe along each row of holes and joining the pipe adjacent to each said row, the pair of flange means being circumferentially closely spaced apart to diffuse said first and second liquid spray lines lengthwise of the pipe into two separate, circumferentially-spaced, but closely positioned, axially-diffused sprays of liquid which extend in the same direction from the pipe;

the spray holes in said second row being axially spaced between the holes of the first row so that the axially diffused sprays of liquid in the first spray line are axially spaced apart from one another but axially overlap the diffused sprays in the second spray line.

4,522,717

FILTER APPARATUS

John E. Brust, 2600 NE. Loop 410, No. 816, San Antonio, Tex. 78217

Filed Jun. 24, 1983, Ser. No. 507,331

Int. Cl.³ B01D *27/06*

U.S. Cl. 210—238 **24 Claims**

1. An apparatus for filtering a liquid-gas mixture using replaceable filter elements, comprising:

a tank having an open upper end and a closed lower end;

a cover secureable across the upper end of the tank for alternatively closing the tank and providing access to the tank interior;

a partition sealed to the tank wall near the upper end of the tank to extend across the tank interior and divide the tank interior into an upper chamber above the partition and a lower chamber below the partition, wherein the upper surface of the partition is formed into an upper tier and a lower tier disposed a distance below the upper tier, and wherein a filter aperture having a circular wall is formed through the partition to intersect said upper tier; and

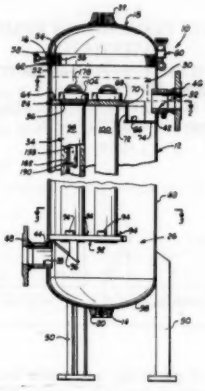
filter means, comprising a replaceable filter element, detachably mounted on said partition for filtering fluid passing through said filter aperture, the filter means comprising:

a header having a first end, a second end and a longitudinal header bore formed therethrough to intersect the ends of the header, portions of the header near the second end thereof having a circular periphery to be matingly received in the filter aperture form the upper side of said partition, wherein a laterally extending wing having a longitudinal channel parallelling the header bore in one side thereof is formed on portions of the header disposed above said partition;

means mounted in the header for releaseably securing a shank placed in said channel within the channel; and

means, including said replaceable filter element, mounted on the header for filtering fluid passing through said header bore;

wherein a stud is mounted on the partition adjacent the filter aperture to extend from the upper side thereof, the stud having a shank sized and positioned on the partition to be received in



said channel at such times that the circular portions of the header are received in the filter aperture, and the stud having an enlarged head at the upper end thereof to overlay portions of said wing; and wherein the tank has an inlet port opening into the lower chamber of the tank and an outlet port opening into the upper chamber of the tank above the lower tier of the partition and on a level wherein the outlet port is bisected by the upper tier of the partition.

10. A filter cartridge, comprising:

a header having a longitudinal header bore formed therethrough and a laterally extending wing having a longitudinal channel, parallelling the header bore, formed in one side of said wing;

means mounted in the header for releasably securing a shank placed in said channel within said channel; and

means mounted on the header for filtering fluid passing through said header bore.

4,522,718

MECHANISM FOR LATCHING AN AXIALLY DISPLACEABLE ROTARY PART TO A CONCENTRIC ROTARY PART

Donald J. Henkel, Loveland, and Donald L. Hurley, Hamilton, both of Ohio, assignors to The Western States Machine Company, Hamilton, Ohio

Filed Jun. 17, 1982, Ser. No. 389,409

Int. Cl.[3] **B01D** *33/06*

U.S. Cl. 210—371 **23 Claims**

1. A latching mechanism for securing in a certain axial position a rotary part that is displaceable axially relative to a concentric rotary part, comprising:

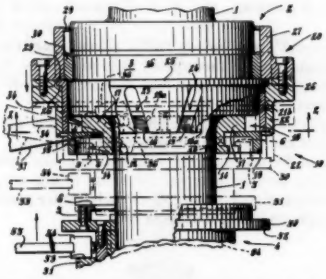
latch means rotated with the concentric part and displaceable radially relative thereto between a latching position and an unlatching position;

a latchable member secured to the axially displaceable part and disposable in the path of said latch means by axial movement of said displaceable part to said certain position;

said latch means and said latchable member respectively comprising elements which, with said displaceable part in said certain position, are interengageable to prevent axial displacement of said displaceable part and are disengageable to release the same, respectively, by radial movements of said latch means between its said positions; and

displacing means on and movable relative to said concentric part for moving said latch means between the latching and unlatching positions.

13. In centrifugal apparatus including a centrifugal basket having a base structure spaced below its bottom wall and fixed



to the lower end of a vertical spindle supporting the basket and for rotating it to high speed, said bottom wall having an opening therein about said spindle for discharge of centrifuged solids downward and then away from said base structure, a basket bottom valve member surrounding and rotatable with said spindle and displaceable axially relative thereto between a position closing said opening and an open position spaced below said opening, and means for positioning said valve member including a spacer member fixed to it and extending upwardly from it about said spindle and a valve operating mechanism engageable with means on said spacer member for moving said valve axially between said positions; a latching mechanism according to claim **1** or claim **2** for securing said valve member in said closing position, said concentric part being said spindle, said displaceable part being said valve member with said spacer member fixed thereto, said certain position being said closing position, and said latchable member being secured to said spacer member.

4,522,719

FILTER WITH A TUBULAR FILTER ELEMENT

Soichi Kuwajima, Yono, and Naojiro Sakamoto, Yokohama, both of Japan, assignors to Nihon Schumacher K.K., Tokyo and Toyo Element Kogyo Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Dec. 22, 1983, Ser. No. 564,498

Claims priority, application Japan, Dec. 24, 1982, 57-230880; Aug. 30, 1983, 58-157205

Int. Cl.[3] **B01D** *27/06*

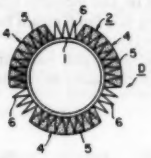
U.S. Cl. 210—457 **6 Claims**

1. A filter comprising:

(a) a perforated support tube;

(b) a tubular filter element wrapped around the support tube, said element having a plurality of corrugations in cross-section and being divided into a plurality of filtering portions in the form of corrugations in its circumferential direction so as to form a plurality of flexible portions which are also in the form of corrugations and which are

capable of expanding and contracting between the two adjoining filtering portions, the opposite ends of each filtering portion being solidified by filling the spaces between the adjoining corrugations with solidifying material in the form of an arc corresponding to the peripheral surface of the support tube so that a specific pitch of the corrugations of the filtering portions can be maintained in a state wherein the adjoining ridges and the adjoining bottom valleys of the corrugations are respectively spaced apart from each other;



(c) two end plates having flange portions and fitted to the opposite ends of the support tube so that the flange portions of the end plates face the end faces of the filter element, respectively;

(d) a plurality of filling members inserted into the opposite ends of each flexible portion, respectively; and

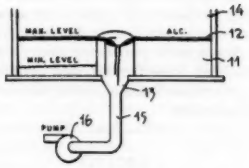
(e) means for fastening the solidified opposite ends of each filtering portion together with the filling members inserted into the opposite ends of each flexible portion to the opposite ends of the support tube.

4,522,720

LIQUID MIXING DEVICE

Isaih Vardi, Rehovoth; Joseph Bourne, Raanana; Jonathan Ben-Dror, Hadar Am, and Yigal Kimchi, Ramat Gan, all of Israel, assignors to Eshel Residual for Cooling and Heating Ltd., Azor, Israel

Continuation of Ser. No. 246,186, Mar. 23, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 484,011
Claims priority, application Israel, Mar. 25, 1980, 59707
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—512.1 **5 Claims**



1. A vortex-inducing structure for use in an aqueous system, said vortex-inducing structure comprising:

a compartment defining a single drain at the bottom of the compartment for draining a first liquid floating on top of another liquid,

at least one helical vane fixed to the bottom of the container at its bottom edge and being located above and surrounding the drain of the compartment for intimately mixing the liquids with each other, the center defined by said at least one helical vane being free so as avoid obstructing the formation of a vortex, and

a lateral inlet defined by said at least one helical vane located along substantially the entire height of the at least one helical vane so that both liquids enter into the interior of the vane structure, are intimately mixed, and exit through the drain.

4,522,721

TREATING PROCESS OF ORGANIC WASTES

Masahiko Ishida, and Ryoichi Haga, both of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 579,009
Claims priority, application Japan, Feb. 15, 1983, 58-22119
Int. Cl.³ C02F *3/28*
U.S. Cl. 210—603 **4 Claims**

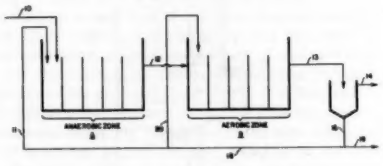
1. A process of anaerobically digesting organic wastes under an anaerobic condition in a digestion tank for recovering methane from said organic wastes by the fermentation effect of said anaerobic bacteria, said process comprising: charging organic wastes having a water content of 50–70% and seed digestives alternatively in a strata formation to said digestion tank said organic wastes formed as a layer between alternating layers of said seed digestives and maintaining the interior of said digestion tank under anaerobic conditions without stirring.

4,522,722

NITROGEN AND PHOSPHORUS REMOVAL FROM WASTEWATER

David M. Nicholas, New Tripoli, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 7, 1983, Ser. No. 472,451
Int. Cl.³ C02F *3/30*
U.S. Cl. 210—605 **4 Claims**



1. The method of purifying wastewater by treatment with activated biomass which comprises passing the influent wastewater through a plurality of treating zones comprising at least an initial anaerobic treating zone and a last oxic treating zone; passing the effluent from said last oxic treating zone to a separation zone to cause settling therefrom of a dense sludge layer containing activated biomass; recycling at least part of said sludge layer to provide the activated biomass employed for treatment of the wastewater; splitting the recycled part of said recycled sludge into a major portion and a minor portion; introducing said minor portion into the initial anaerobic treating zone wherein it is admixed with wastewater influent, and introducing the major portion of said recycled sludge into an oxic treating zone, wherein the contents of said oxic zone are subjected to oxygenation by contact with oxygen-containing gas admitted to said zone.

4,522,723

PROCESS FOR THE REMOVAL AND RECOVERY OF HEAVY METALS FROM AQUEOUS SOLUTIONS

Jim W. Kauffman, and William C. Laughlin, both of Edmond, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 1, 1984, Ser. No. 616,415
Int. Cl.³ C02F *3/34*
U.S. Cl. 210—611 **18 Claims**

1. A process for reducing the concentration of water soluble ionic heavy metal species in an aqueous solution containing the same comprising:

providing an aqueous solution containing sulfate ions and water soluble ionic heavy metal species, said aqueous solution having a pH of at least about 6.0;

providing a porous matrix containing a population of bacteria capable of reducing said sulfate ions to hydrogen

sulfide wherein said population of bacteria comprises at least one anaerobic bacteria selected from the group consisting of bacteria of the genera, Desulfovibrio and Desulfotomaculum said matrix being under anaerobic conditions; and

passing said aqueous solution through said porous matrix in the presence of nutrients and at predetermined temperatures, said nutrients and said temperatures providing for the growth and steady state population density of said bacteria, to contact the sulfate ions in said aqueous solution with the bacteria contained in the porous matrix whereby said bacteria metabolically reduce at least a portion of the sulfate ions to hydrogen sulfide which reacts with at least a portion of the water soluble ionic heavy metal species to form water insoluble heavy metal species which substantially are retained on the porous matrix, and to produce an aqueous effluent having a reduced concentration of said water soluble ionic heavy metal species.

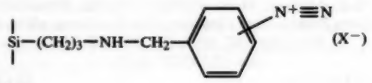
4,522,724

DIAZONIUM AFFINITY MATRIXES

Hugh E. Ramsden, Scotch Plains, N.J., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Mar. 2, 1984, Ser. No. 585,783
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—635 **20 Claims**

2. A diazobenzylaminopropyl silica gel of the formula



wherein

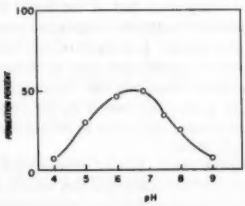
is a silica gel and X^- is an anion.

4,522,725

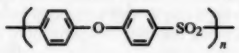
PROCESS FOR SEPARATING PLASMA ALBUMIN

Kenji Koyama; Syotaro Ohno, both of Tokuyama, and Mitsutoshi Fukuda, Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

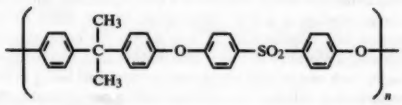
Filed Nov. 6, 1980, Ser. No. 204,717
Claims priority, application Japan, Jan. 10, 1980, 55-855
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—639 **4 Claims**



1. A process for purification of plasma albumin from crude fraction thereof which comprises separating a crude albumin fraction from blood plasma by a rough fractionation method and then separating plasma albumin in a purified fraction through an ultrafiltration membrane of a polysulfone resin having the formula:



or



(n=50 to 250)

4,522,726

ADVANCED SEPARATION DEVICE AND METHOD

W. Wess Berry, Brandon, Fla.; Rae A. Schmeda, Littleton, and Holly S. Kibler, Boulder, both of Colo., assignors to Progress Equities Incorporated, St. Petersburg, Fla.

Filed Jul. 30, 1984, Ser. No. 635,837
Int. Cl.³ B01D *15/02*
U.S. Cl. 210—660 **3 Claims**

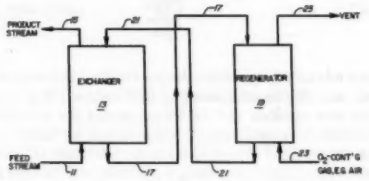
1. An advanced separation device for the treatment of a fluid stream, said device comprising: a feed box defining a plurality of feed box sections and including means for introducing a fluid stream into each one of said feed box sections; an upper timing crown fixed to said feed box downstream of said means for introducing and comprising a plurality of feed slots formed therethrough, each one of said feed slots being in fluid communicating relation to a corresponding one of said feed box sections; an upper distribution crown movably disposed in substantially congruent relation to said upper timing crown and downstream thereof, said upper distribution crown comprising a plurality of upper distribution slots formed therethrough, at least one of said plurality of feed slots being disposable into fluid communicating relation with at least one of said upper distribution slots; a distribution box defining a plurality of distribution compartments fixed to said upper distribution crown downstream thereof whereby each one of said distribution compartments is in fluid communicating relation to a corresponding one of said upper distribution slots, said distribution box further comprising an outlet means for each of said distribution compartments downstream of said upper distribution crown; a separator body defining a plurality of working compartments and including means for receiving a fluid stream into each one of said working compartments, said separator body being disposed downstream of said distribution box and each one of said means for receiving being connected in fluid communicating relation to a corresponding one of said outlet

means, said separator body further comprising a discharge means for each of said working compartments downstream of said means for receiving; a collection box defining a plurality of collection compartments and including means for collecting a fluid stream into each one of said collection compartments, said collection box being disposed downstream of said separator body and each of said means for collecting being disposed in fluid communicating relation to a corresponding one of said discharge means; a lower distribution crown fixed to said collection box downstream of said means for collecting and comprising a plurality of lower distribution slots formed therethrough, each one of said lower distribution slots being in fluid communicating relation to a corresponding one of said collection compartments; a lower timing crown disposed downstream of said lower distribution crown in substantially congruent, immobile relation thereto and comprising a plurality of discharge slots formed therethrough, at least one of said plurality of discharge slots being in fluid communicating relation to at least one of said lower distribution slots; a discharge box defining a plurality of discharge sections fixed to said lower timing crown downstream of said lower distribution crown whereby each one of said discharge sections is in fluid communicating relation to a corresponding one of said discharge slots, said discharge box further comprising means for withdrawing a treated fluid stream from each one of said discharge sections; and drive means operatively connected to said device whereby said upper distribution crown, said distribution box, said separator body, said collection box and said lower distribution crown may be rotated with respect to said feed box and said upper timing crown and with respect to said lower timing crown and said discharge box.

4,522,727
PROCESS FOR CONTINUOUS REMOVAL OF AMMONIACAL NITROGEN FROM AQUEOUS STREAMS

Willis W. Weber, Riverton, Wyo., assignor to ATEC Inc., Riverton, Wyo.

Filed Oct. 22, 1984, Ser. No. 663,233
Int. Cl.[3] C02F *1/42*; B01J *29/38*
U.S. Cl. 210—673 **41 Claims**



1. A continuous process for removal of ammoniacal nitrogen from water which comprises

passing a stream of liquid water containing ammoniacal nitrogen in an ion exchange zone in continuous counter current liquid-solid contact with a stream of particulate, ammoniacal nitrogen-sorbing zeolitic ion exchange material having a substantially uniform particle size for a time period sufficient to produce a treated liquid water stream having a reduced ammoniacal nitrogen content and a stream of ammoniacal nitrogen-enriched particulate zeolitic material;

recovering the stream of ammoniacal nitrogen-enriched particulate zeolitic ion exchange material and passing an oxygen-containing gas stream in continuous counter current contact with the stream of ammoniacal nitrogen-enriched particulate zeolitic ion exchange material in a heating zone while said material is maintained at a temperature of about 350° C. to about 650° C. for a time period sufficient to provide a stream of regenerated, particulate ammoniacal nitrogen sorbing zeolitic ion exchange material having a reduced ammoniacal nitrogen content;

cooling the stream of regenerated particulate zeolitic ion exchange material in a cooling zone to a temperature of less than about 350° C.; and

recycling the cooled particulate zeolitic ion exchange material stream to contact said stream of liquid water containing ammoniacal nitrogen.

38. A process for continuous regeneration of a particulate, zeolitic ion exchange material bearing ammoniacal nitrogen which comprises the steps of

forming a moving stream of said particulate material defining a preheating zone and a heating zone;

passing a stream of an oxygen-containing gas through said heating zone in a direction counter current to the direction of movement of said moving stream;

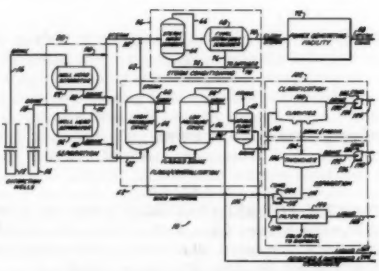
maintaining said particulate material in said heating zone at a temperature of about 350° C. to about 650° C. while said oxygen-containing gas is passed therethrough; and

passing gases emanating from said heating zone through said preheating zone in a direction counter current to the direction of movement of said moving stream.

4,522,728
ACIDIFICTION OF STEAM CONDENSATE FOR INCOMPATIBILITY CONTROL DURING MIXING WITH GEOTHERMAL BRINE

Darrell L. Gallup, Ontario, and John L. Featherstone, El Centro, both of Calif., assignors to Union Oil Company of California, Los Angeles; Mono Power Company, Rosemead and Southern Pacific Land Company, San Francisco, all of, Calif.

Filed Dec. 30, 1983, Ser. No. 567,254
Int. Cl.[3] C02F *1/52*
U.S. Cl. 210—714 **22 Claims**



1. A method of combining condensate of geothermally derived steam with a flow of geothermal liquid containing water and impurities, said geothermal liquid having an acidic pH, said condensate having a basic pH and containing water and volatile impurities, the impurities in said geothermal liquid and said condensate being such that, if the liquid and condensate are combined without treatment, suspended particulate matter would form in the mixture as a result of reaction between said geothermal liquid impurities and said condensate volatile impurities, said method comprising the reducing of the formation of said suspended particulate matter by the steps of:

(a) treating the steam condensate to reduce the pH thereof to no more than about 7;

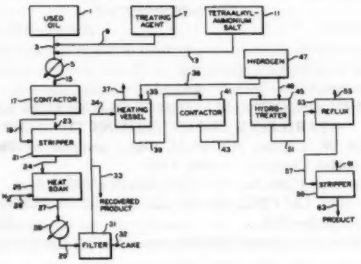
(b) outgassing the condensate of reduced pH to reduce the concentration of volatile impurities which, when the condensate and geothermal liquid are combined react with the impurities in the geothermal liquid to cause the formation of said suspended particulate matter, the amount of said particulate matter being thereby reduced; and

(c) combining the outgassed condensate with the flow of geothermal liquid.

4,522,729
FILTRATION OF OIL

Donald C. Tabler, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 30, 1984, Ser. No. 635,855
Int. Cl.[3] B01D *37/00*; C10M *11/00*
U.S. Cl. 210—727 17 Claims



1. In a process for removing ash-forming contaminants from a used oil by mixing said used oil with an aqueous solution of an ammonium salt treating agent at conditions of temperature and pressure sufficient for reaction of the treating agent with the contaminants in the used oil to form a precipitate of reacted contaminants, the improvement which comprises contacting the mixture with at least one tetraalkylammonium salt representable by the formula:

$$\left[\begin{array}{c} R \\ | \\ R-N-R \\ | \\ R \end{array}\right]_a^+ [X]^{a-}$$

wherein the R groups may be the same or different from each other, each R being an alkyl group having from 1 to 6 carbon atoms, and X is an organic or inorganic anion, and a is the valence of X, the amount of said at least one tetraalkylammonium salt being suitable to improve the filtration of solid materials from the thus treated used oil, and subjecting the resulting mixture to filtration to remove solid materials from the used oil.

12. A process for improving the filtration rate of an oil containing very fine solid materials which comprises admixing the oil with at least one tetraalkylammonium salt representable by the formula:

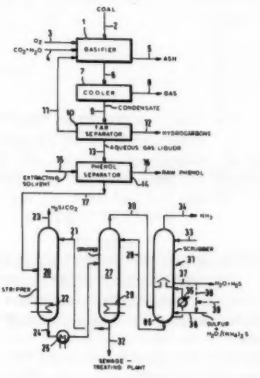
$$\left[\begin{array}{c} R \\ | \\ R-N-R \\ | \\ R \end{array}\right]_a^+ [X]^{a-}$$

wherein the R groups may be the same or different from each other, each R being an alkyl group having from 1 to 6 carbon atoms, X is a monovalent or multivalent organic or inorganic anion, and a is the valence of X, the amount of said at least one tetraalkylammonium salt being suitable to improve the filtration of the solid materials from the thus treated oil, and subjecting the resulting mixture to filtration to remove solid materials from the oil.

4,522,730
PROCESS FOR THE TREATMENT OF AN AQUEOUS CONDENSATE

Gerhard Hochgesand, Heusenstamm, Fed. Rep. of Germany; Heinz Kahles, Johannesburg-Meredale, South Africa; Paül Wiesner, Friedrichsdorf, and Hans-Martin Stönner, Schwalbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,851
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310712
Int. Cl.[3] C02F *1/20, 1/58*
U.S. Cl. 210—750 7 Claims



1. A process for treating an aqueous condensate containing cyanide ions, hydrogen sulfide and ammonia which comprises the steps of:

(a) stripping said aqueous condensate by heating a portion thereof to produce water vapor and contacting the water vapor with said condensate to remove hydrogen sulfide from said condensate;

(b) recovering from step (a) an overhead product and scrubbing same with water under a pressure of 1 to 30 bar to remove residual hydrogen sulfide therefrom while discharging ammonia in a gaseous form from said overhead product to produce an aqueous laden absorbent containing 50 to 300 grams ammonia and 10 to 100 grams of hydrogen sulfide per liter at a temperature of 50° to 150° C. and a pH value of at least 9;

(c) passing said laden absorbent to at least one stripping column in which the stripping of hydrogen sulfide from said condensate is effected as recited in step (a); and

(d) introducing sulfur to the laden absorbent or to said condensate in a amount at least 0.8 times the quantity stoichiometrically required to convert the cyanide ions therein to thiocyanate ions.

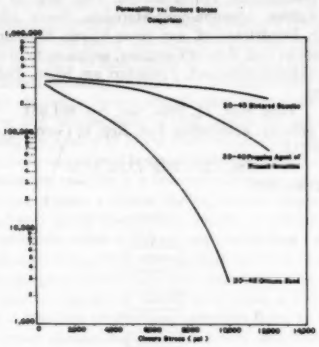
4,522,731
HYDRAULIC FRACTURING PROPPING AGENT

Eugene P. Lunghofer, Youngstown, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 28, 1982, Ser. No. 437,206
Int. Cl.[3] C09K *3/00*
U.S. Cl. 252—8.55 R 3 Claims

1. In a hydraulic fracturing method in which a fluid is injected into a subterranean formation to open a fracture therein, the improvement wherein said fracture is propped open with a high strength propping agent comprising solid, spherical parti-

cles, said particles having an alumina content of between 40 and 60%, a density of less than 3.0 gm/cc, and an ambient



temperature permeability of 100,000 or more millidarcies at 10,000 psi.

4,522,732

PROCESS FOR RECOVERING PETROLEUM FROM A GEOLOGICAL FORMATION

Robert F. Purcell, Roselle, Ill., and Robert B. Kayser, Evergreen, Colo., assignors to Angus Chemical Company, Northbrook, Ill.

Continuation-in-part of Ser. No. 284,438, Jul. 20, 1981, abandoned. This application May 14, 1984, Ser. No. 609,637

Int. Cl.³ E21B *43/24, 43/22*

U.S. Cl. 252—8.55 D **9 Claims**

1. An improved process for recovering petroleum from a geological formation containing it comprising injecting steam at elevated temperature and pressure into the formation mixed with an amine which is 2-amino-2-methylpropanol or N-N-dimethylaminomethylpropanol or mixture thereof, in an amount equivalent to about 1–5 g per unit of pore volume and recovering petroleum from said formation.

4,522,733

SUBSTANTIALLY NEUTRAL AQUEOUS LUBRICANT

Nelson Jonnes, Stillwater, Minn., assignor to American Polywater Corporation, Stillwater, Minn.

Continuation-in-part of Ser. No. 462,362, Jan. 31, 1983, Pat. No. 4,461,712. This application Jul. 23, 1984, Ser. No. 633,247

Int. Cl.³ C10M *3/04*

U.S. Cl. 252—49.3 **21 Claims**

1. An aqueous lubricant which comprises:
(a) a major proportion of water;
(b) an effective gelling amount of a polymeric polyelectrolyte acrylate compound having a molecular weight of at least about 1,000;
(c) an effective lubricating amount of a fatty acid salt compound; and
(d) an effective lubricating amount of polyacrylamide having a molecular weight of at least about 300,000;
wherein the pH of the aqueous gel lubricant is about neutral.

4,522,734

BORATED FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill; Henry Ashjian, East Brunswick, and Henry A. Gawel, Clark, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,752

Int. Cl.³ C10M *1/54*

U.S. Cl. 252—49.6 **21 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or a grease prepared therefrom and minor effective proportion of from about 0.1 to about 10 wt. % of a multi-functional additive having friction modifying characteristics selected from the group consisting of borate esters of hydrolyzed, hydrocarbyl alkoxides, or mixtures thereof, where the hydrocarbyl moiety contains from 14 to about 36 carbon atoms.

4,522,735

POLYPHOSPHORAMIDITE OLIGOMERS AND STABILIZER COMPOSITIONS THEREOF

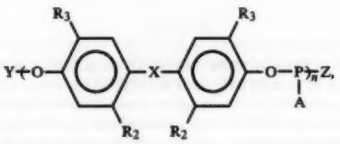
Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 17, 1983, Ser. No. 505,516

Int. Cl.³ C07D *203/06, 205/04, 211/06, 265/30*

U.S. Cl. 252—49.9 **18 Claims**

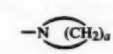
1. Polyphosphoramidite oligomers having the formula



wherein: A is

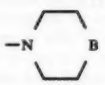
(1)

wherein R_1 is an alkyl radical containing 1 to 4 carbon atoms,



(2)

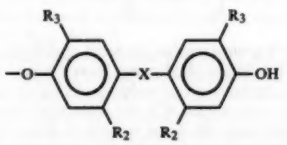
wherein a is 3 to 6, or



(3)

wherein B is —O—; R_2 and R_3 are hydrogen, primary, secondary or tertiary alkyl radicals containing 1 to 4 carbon atoms; X is $>CH_2$, $>CHCH_3$, $>CHCH_2CH_3$, $>CHCH_2CH_2CH_3$, $>C(CH_3)_2$; Y is H or

wherein Q is Cl or OH; Z is Cl, OH, or



wherein R_2, R_3 and X have the meanings given above; and n is 2 to 10.

4,522,736

PRODUCTS OF REACTION INVOLVING ALKENYLSUCCINIC ANHYDRIDES WITH AMINOALCOHOLS AND AROMATIC SECONDARY AMINES AND LUBRICANTS CONTAINING SAME

Harry J. Andress, Wenonah, and Henry Ashjian, E. Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 443,500, Nov. 22, 1982, abandoned. This application Apr. 24, 1984, Ser. No. 603,274

Int. Cl.[3] C10M *1/32*

U.S. Cl. 252—51.5 A 23 Claims

1. A product of reaction made by (a) reacting an alkenylsuccinic compound selected from the group consisting of an alkenylsuccinic acid and the anhydride thereof with a diaromatic secondary amine of the formula

$$ArNHAr^1$$

wherein Ar and Ar^1 may be the same or different aromatic group having 6 to 50 carbon atoms or the C_1 to C_{44} aliphatic group substituted member thereof, the reaction being carried out at from about 50° C. to about 250° C. using from about 0.1 to about 1.0 mole of said secondary amine per mole of acid or anhydride, followed by (b) reacting the product of (a) with a compound selected from the group consisting of an alkanolamine of the formula

$$(HOR^3)_xN(H)_y$$

wherein R^3 is an alkylene group having 1 to 6 carbon atoms, x is 1 to 3 and y is 0 to 2, their sum being 3, and an aminomethane of the formula

$$(HOR^4)_{x'}C(H)_{y'}NH_2$$

wherein R^4 is the same as R^3 and x' and y' have the same meaning as x and y, the reaction in (b) being carried out at from about 100° C. to about 300° C. using from about 0.1 mole to about 1.2 moles of amine reactant per mole of acid or anhydride used in (a).

10. A lubricant composition comprising a major proportion of a lubricating oil or grease therefrom and from about 0.05 to about 15% by weight of the composition of a product of reaction made by (a) reacting an alkenylsuccinic compound selected from the group consisting of an alkenylsuccinic acid and the anhydride with a diaromatic secondary amine of the formula

$$ArNHAr^1$$

wherein Ar and Ar^1 may be the same or different aromatic group having 6 to 50 carbon atoms or the C_1 to C_{44} aliphatic group substituted member thereof, the reaction being carried out at from about 50° C. to about 250° C. using from about 0.1 to about 1.0 mole of said secondary amine per mole of acid or anhydride, followed by (b) reacting the product of (a) with a compound selected from the group consisting of an alkanolamine of the formula

$$(HOR^3)_xN(H)_y$$

wherein R^3 is an alkylene group having 1 to 6 carbon atoms, x is 1 to 3 and y is 0 to 2, their sum being 3, and an aminomethane of the formula

$$(HOR^4)_{x'}C(H)_{y'}NH_2$$

wherein R^4 is the same as R^3 and x' and y' have the same meaning as x and y, the reaction in (b) being carried out at from about 100° C. to about 300° C. using from about 0.1 mole to about 1.2 moles of amine reactant per mole of acid or anhydride used in (a).

4,522,737

ELECTROLYTES FOR ELECTROLYTIC CAPACITORS

Richard W. MacNamee, Pickens, S.C., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Aug. 8, 1983, Ser. No. 521,305

Int. Cl.[3] H01G *9/00*

U.S. Cl. 252—62.2 11 Claims

1. An electrolyte for an electrolytic capacitor, comprising:

about 2 to 20 weight percent of ammonium formate;

about 1 to 12 weight percent of a dicarboxylic acid of 2 to 8 carbons or its diammonium salt, wherein the ammonium ion is of the formula NH—$(R)_3$ in which R is H, alkyl of 1 to 7 carbons or alkanol of 1 to 7 carbons;

the balance being an alkyl glycol of 2 to 4 carbons.

4,522,738

TOILET BOWL CLEANER

David J. Magid, 40 Woodview Dr., Doylestown, Pa. 18901, and W. Thomas Ruckle, 706 Deerbrook Rd., Bel Air, Md. 21014

Filed Apr. 26, 1983, Ser. No. 488,770

Int. Cl.[3] C11D *17/04*

U.S. Cl. 252—90 18 Claims

1. A double envelope toilet bowl cleaner comprising an outer, polymeric water-soluble envelope having therein an acidic material and an inner, polymeric water-soluble envelope having therein a basic material wherein the envelope containing the basic material is insoluble in the environment of the acidic material and wherein when said toilet bowl cleaner is placed in a toilet bowl the basic material is released into the bowl water subsequent to the release of and cleaning of the toilet bowl by the acidic material, and said acidic material interacts with said basic material in said bowl to release carbon dioxide gas and wherein the number of neutralization equivalents of said basic material are equal to or greater than the number of neutralization equivalents of said acidic material.

4,522,739

ACTIVATED PEROXY COMPOUND BLEACHING COMPOSITIONS AND BLEACHING DETERGENT COMPOSITIONS AND PROCESS OF USING SAME

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 929,845, Jul. 31, 1978, Pat. No. 4,292,191, which is a continuation-in-part of Ser. No. 629,117, Nov. 5, 1975, Pat. No. 4,107,065. This application Aug. 17, 1981, Ser. No. 293,573

Int. Cl.[3] C11D *7/18, 7/38;* D06L *3/02*

U.S. Cl. 252—95 14 Claims

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of an aromatic sulfonyl fluoride of the formula $ArSO_2F$ wherein Ar is an aromatic ring system selected from the class consisting of a phenyl group, a naphthyl group, and a heterocyclic group having 5 to 6 members of which 1 to 2 are heteratoms selected from the class consisting of nitrogen, oxygen and sulfur, said groups optionally bearing substituents selected from the class consisting of nitro, carboxyl, hydroxy, sulfo alkyl of 1 to 16 carbon atoms, alkoxy of 1 to 16 carbon atoms, aliphatic carboxamido of 1 to 16 carbon atoms, aliphatic acyl of 1 to 16 carbon atoms, chlorine and bromine.

4,522,740

POLYGLYCOL ETHERS AS FOAM-INHIBITING ADDITIVES IN LOW-FOAM CLEANING AGENTS

Karl Schmid, Mettmann; Horst Baumann, Leichlingen; Jürgen Geke, Düsseldorf; Hans-Günther Germscheid, Hösel; Werner Lüdecke, Erkrath; Robert Piorr, Ratingen; Christian Rossmann, Langenfeld; Rolf Scharf, Monheim, and Hans-Joachim Schlüssler, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,477

Claims priority, application Fed. Rep. of Germany, May 2, 1983, 3315952

Int. Cl.³ C11D *1/72*

U.S. Cl. 252—174.21 4 Claims

1. In the process of controlling undesirable foam development when subjecting surfaces of metal, glass ceramic or plastic to an aqueous washing process by addition of a foam-inhibiting substance thereto, the improvement consisting of using a foam-inhibiting amount of a polyglycerol polyethylene glycol alkyl ether of 1 part by weight of polyglycerol having a hydroxyl number in the range of from 900 to 1200 adducted with from 4 to 20 parts by weight of ethylene oxide and etherified at the free hydroxyl groups with alkyls having from 4 to 8 carbon atoms, as said foam-inhibiting substance.

4,522,741

TRANS-4-ALKYLOXYMETHYL-1-(4'-SUBSTITUTED BIPHENYLYL-4)CYCLOHEXANES

Hiromichi Inoue; Takashi Inukai; Yasuyuki Goto; Hideo Sato, and Masahiro Fukui, all of Kanagawaken, Japan, assignors to Chisso Corporation, Osaka, Japan

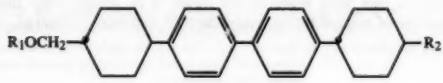
Filed Jun. 8, 1983, Ser. No. 502,233

Claims priority, application Japan, Jun. 12, 1982, 57-101172

Int. Cl.³ C09K *3/34;* C07C *43/168;* G02F *1/13*

U.S. Cl. 252—299.63 3 Claims

1. A compound, expressed by the formula



wherein R_1 and R_2 each represents an alkyl group of 1 to 8 carbon atoms.

4,522,742

WATER SOLUBLE FLUOR COMPOSITIONS

Duk H. Lee, Wellesley; Susan Feierberg, Watertown, and Robert E. O'Brien, Belmont, all of Mass., assignors to E. I. Du Pont de Nemours and Company Inc., Wilmington, Del.

Filed Feb. 25, 1982, Ser. No. 352,209

Int. Cl.³ B01D *13/02;* B01J *31/02;* C09K *11/06;* G21H *5/02*

U.S. Cl. 252—301.16 5 Claims

2. A composition of matter, comprising at least two water soluble fluors, each fluor having a structure in accordance with the formula:

$$[F]_x[B]_y[S]_z$$

wherein F is a component which absorbs energy and emits electromagnetic energy, S is a component which makes the fluor water soluble, and B is a chemical bond or other component which bonds a component F with a component S, and x,y and z are from 1 to 10, said composition wherein each water soluble fluor is selected from the group consisting of: 4-[5-(2-phenyloxazolyl)]benzene sulfonic acid or water soluble salt thereof, naphthalene-2-sulfonic acid or water soluble salt thereof, methoxypolyethyleneglycol 4-(2,5-diphenyloxolyl) methylether, polyethyleneglycol di-1-naphthylmethyl ether, 2,5-diphenyl-3-methyloxazolium toluene sulfonate, N-[4-(2,5-diphenyloxazolyl) methyl] acrylamide, N-[1-naphthylmethyl] acrylamide, N-[4(2,5-diphenyloxazolyl)methyl]-trimethyl ammonium chloride, N-[4-(2,5-diphenyloxazolyl) methyl]-N-benzyl-N,N-dimethyl ammonium chloride,

4,522,743

PREPARATION OF FINELY DIVIDED PULVERULENT CAROTINOID AND RETINOID COMPOSITIONS

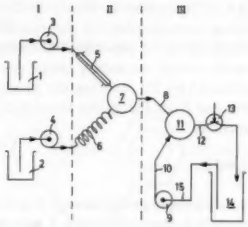
Dieter Horn, Heidelberg; Hans W. Schmidt, Mannheim; Walter Ditter, Heidelberg; Horst Hartmann, Boehl-Iggelheim; Erik Lueddecke, Mutterstadt, and Klaus Schmieder, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,585

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119383

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—311 5 Claims



1. A process for the preparation of finely divided, pulverulent carotinoid or retinoid compositions, in which the carotinoid or retinoid essentially has a particle size of less than 0.5 micron, wherein a carotinoid or retinoid is dissolved in a volatile, water-miscible, organic solvent at from 100° C. to 200° C., if necessary under superatmospheric pressure, within the space of less than 10 seconds, the carotinoid or the retinoid is immediately precipitated, in a colloidally disperse form, from the molecularly disperse solution by rapidly mixing the latter with an aqueous solution of a swellable colloid at from 0° C. to 50° C., and the resulting dispersion is freed from the solvent and the dispersing medium in a conventional manner.

4,522,744

BURNABLE NEUTRON ABSORBERS

Bruce M. Argall; Peter J. Kuchirka, both of Penn Hills, and Kenneth C. Radford, Churchill Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1982, Ser. No. 416,767

Int. Cl.³ G21C *7/24;* G21F *1/10*

U.S. Cl. 252—478 5 Claims

1. The method of making a burnable neutron absorber body for a nuclear reactor which comprises:

(a) coating boron-compound particles with a pore former;

(b) separately producing a slurry of matrix powder in a liquid;

(c) mixing the boron-compound particles coated with pore former in said slurry to produce a slurry of the boron-compound particles coated with pore former and the matrix powder;

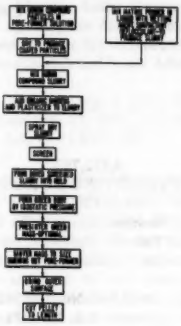
(d) adding a binder to said last-named slurry to produce a resulting slurry, said pore former being insoluble in the binder system formed of the resulting slurry;

(e) spray drying the resulting slurry thus produced to obtain a free-flowing mixture of coated boron-compound particles and matrix powder;

(f) forming a green body of said mixture; and

(g) sintering said green body and burning out the pore for-

mer to form a sintered body of the boron compound in a matrix with substantially all boron-compound particles in



a void so as to accommodate expansion of the boron-compound particles during subsequent irradiation.

4,522,745

FUSED 5,6,5-MEMBERED HETEROCYCLIC ELECTROACTIVE POLYMERS

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,394
Int. Cl.³ H01B *1/00*
U.S. Cl. 252—500 **26 Claims**

1. An electroactive polymer which comprises a charged polymer backbone of recurring units of a fused 5,6,5-membered aromatic heterocyclic ring system wherein the 5-membered rings contain at least one nitrogen and a second heteroatom selected from the group consisting of O, S, Se, Te, and substituted N, wherein the substituent is selected from the group consisting of lower alkyl C_1–C_6, aryl, cycloalkyl, and alkoxy, and a sufficient concentration of a charge-compensating ionic dopant associated therewith, wherein the polymer backbone is capable of undergoing reversible oxidation or reversible reduction or both to form the charged polymer backbone.

4,522,746

ELECTRICALLY CONDUCTIVE POLY(β-DIKETONE) AND PROCESS THEREFOR

Yoshiyuki Okamoto, Fort Lee, N.J., and Edward F. Hwang, Brooklyn, N.Y., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,406
Int. Cl.³ H01B *1/00*
U.S. Cl. 252—500 **6 Claims**

1. The process of forming an electrically conductive poly(β-diketone) having a conductivity of at least $10^5 ohm^{-1}cm^{-1}$ which comprises doping at room temperature said poly(β-diketone) with 0.2–0.5 moles of an electron acceptor dopant per molecule of diketene monomer unit in the poly(β-diketone), said dopant being present in the vapor phase or in solution in an organic solvent.

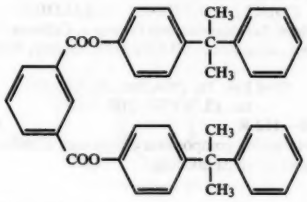
4,522,747

CAPACITANCE ELECTRONIC DISC MOLDING COMPOSITIONS

Mohamed E. Labib, Princeton; Robert F. Poll, Somerset, and Chih-Chun Wang, Hightstown, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 26, 1984, Ser. No. 624,821
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—511 **9 Claims**

1. In a conductive molding composition for a capacitive electronic disc comprising from about 70 to about 80 percent by weight of a thermoplastic resin selected from the group consisting of: a homopolymer or copolymer of vinyl chloride, or a mixture thereof; and a homopolymer of styrene or an acrylic monomer, or their copolymers; from about 12 to about 20 percent by weight of finely divided conductive carbon black; from about 1 to about 5 percent by weight of a compatible stabilizer, from about 0.5 to about 3 percent of a compatible lubricant, from about 3 to about 10 percent by weight of a compatible plasticizer, and from 0 to about 3 percent by weight of a compatible modifier, the improvement wherein all ingredients of said composition are solids and the plasticizer is cumylphenyl isophthalate, represented by the formula



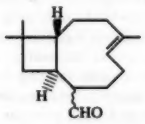
4,522,748

BICYCLIC ALDEHYDE AND ITS USE AS PERFUMING AGENT

Bruno Maurer, Collonges-Bellerive, and Arnold Hauser, Aire-la-Ville, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Aug. 19, 1983, Ser. No. 524,574
Claims priority, application Switzerland, Sep. 6, 1982, 5280/82
Int. Cl.³ C07C *47/115;* A61K *7/46*
U.S. Cl. 252—522 R **2 Claims**

1. A substantially pure bicyclic aldehyde of formula



(I)

wherein indicates a C—C single bond of cis or trans configuration with respect to the neighbouring C H bond.

2. Perfuming composition containing as fragrance active ingredient a bicyclic aldehyde of formula (I) as set forth in claim 1.

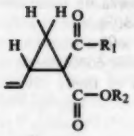
4,522,749

PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF A FRAGRANCE BY ADDING A VINYLCYCLOPROPANE COMPOUND

Richard G. Fayter, Jr., Fairfield, and Eugene G. Harris, West Chester, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 333,212, Dec. 21, 1981,. This application Oct. 31, 1983, Ser. No. 547,159
Int. Cl.³ A61K *7/46;* C11B *9/00*
U.S. Cl. 252—522 R **4 Claims**

1. A process for augmenting or enhancing the aroma of a fragrance formulation comprising the step of adding to said formulation an aroma augmenting or enhancing quantity of a vinylcyclopropane compound of the structure



where R_1 is an alkyl or alkenyl group having 4 to 8 carbon atoms and R_2 is a C_{1-4} alkyl group.

4,522,750

CYTOTOXIC COMPOSITIONS OF TRANSFERRIN COUPLED TO VINCA ALKALOIDS

Edwin W. Ades, Indianapolis, and George J. Cullinan, Trafalgar, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 21, 1984, Ser. No. 581,925

Int. Cl.³ C07G *7/00, 7/04*

U.S. Cl. 260—112 R **10 Claims**

1. A cell-targeting composition comprising transferrin covalently coupled to vinca alkaloid.

4,522,751

METHOD FOR PRODUCING A PREPARATION CONTAINING FACTOR VIII (AHF)

Yendra Linnau, and Otto Schwarz, both of Vienna, Austria, assignors to Immuno Aktiengesellschaft für Chemisch-Medizinische Produkte, Vienna, Austria

Filed May 18, 1984, Ser. No. 611,638

Claims priority, application Austria, May 20, 1983, 1858/83

Int. Cl.³ C07G *7/00;* A61K *35/14*

U.S. Cl. 260—112 B **10 Claims**

1. A method of producing a preparation containing Factor VIII (AHF) from a Factor-VIII-containing plasma fraction, said preparation containing Factor VIII (AHF) having a specific activity of at least 1.5 units of Factor VIII/mg protein, immunoglobulin G (IgG) of from 15 to 30 mg/1000 units of Factor VIII and fibrinogen of from 20 to 40 mg/100 units of Factor VIII, said method comprising the steps of:

(a) dissolving said Factor-VIII-containing plasma fraction in a buffer solution containing a sulfated polysaccharide at a pH value approximately in the neutral range;

(b) lowering the pH to a value ranging from 6.0 to 6.4 and adjusting the temperature to between about 0° C. to about 25° C. to precipitate undesired proteins and obtain a Factor-VIII-containing supernatant;

(c) adding at least one member of the group consisting of glycine, sodium chloride and sodium citrate, to said Factor-VIII-containing supernatant to maintain the major part of the immunoglobulins contained in said supernatant in solution;

(d) adding a protein precipitating agent to obtain a Factor-VIII-containing precipitate; and

(e) dissolving said Factor-VIII-containing precipatate in a solvent to obtain the final product.

4,522,752

RETRO-INVERSO ANALOGUES OF THE BRADYKININ POTENTIATING PEPTIDE BPP_{5a} AND METHODS FOR THEIR PREPARATION

Alessandro Sisto, Rome; Antonio S. Verdini, Monterotondo, and Antonino Virdia, Rome, all of Italy, assignors to E.N.I. Ente Nazionale Idrocarburi, Rome, Italy

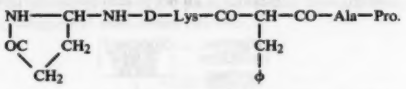
Filed May 10, 1984, Ser. No. 608,985

Claims priority, application Italy, May 13, 1983, 21083 A/83

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. The product



4,522,753

METHOD FOR PRESERVING POROSITY IN POROUS MATERIALS

Ioannis V. Yannas, Newton Center; John F. Burke, Belmont, both of Mass., and Peter J. Stasikelis, Houston, Tex., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 169,897, Jul. 17, 1980, abandoned. This application Jul. 29, 1981, Ser. No. 287,930

Int. Cl.³ B29D *27/00*

U.S. Cl. 260—123.7 **8 Claims**

1. A method of producing dimensionally-stable, non-collapsible highly porous foams based upon insoluble protein-based material, comprising:

a. forming a liquid dispersion of said insoluble protein-based material;

b. quickly freezing said dispersion to form frozen liquid particles;

c. subliming said frozen liquid particles to produce a highly porous foam;

d. subjecting said highly porous foam to an elevated temperature of from about 80° C. to about 180° C. and vacuum of from about 1 mtorr to just below atmospheric pressure, said temperature and vacuum conditions being sufficient to stabilize said highly porous foam so that its porosity is preserved when it is contacted with a liquid solution of a chemical crosslinking agent, and,

e. subjecting said stabilized highly porous foam to a liquid solution of a chemical crosslinking agent so as to produce a dimensionally-stable, non-collapsible highly porous foam material.

4,522,754

METALLICALLY CONDUCTING (2-FLUORO-5,6,11,12-TETRASELENOTETRACENE)$_2$-BROMIDE

Bruno Hilti, Basel; Carl W. Mayer, Riehen, and Grety Rihs, Muttenz, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

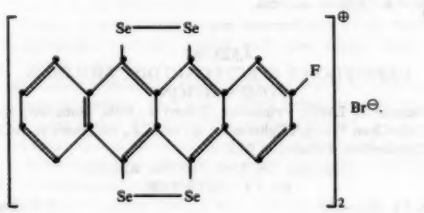
Filed Nov. 2, 1983, Ser. No. 548,048

Claims priority, application Switzerland, Dec. 11, 1982, 6611/82

Int. Cl.³ C07D *517/06;* H01B *1/00;* B32B *9/04*

U.S. Cl. 260—239 R **2 Claims**

1. A complex of the formula I



4,522,755

METAL PHTHALOCYANINE INTERMEDIATES FOR THE PREPARATION OF POLYMERS

Bappalige N. Achar, Mysore, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 415,880, Sep. 8, 1982, Pat. No. 4,456,268. This application Sep. 15, 1983, Ser. No. 514,117

Int. Cl.³ C07D *487/22*

U.S. Cl. 260—245.75 5 Claims

1. A method of preparing an isolated metal 4,4',4'',4'''-tetracarboxylic phthalocyanine which comprises

a. heating at about 185° C. for about four hours a reaction mixture comprising an anhydride consisting essentially of trimellitic anhydride, a source of metal selected from finely divided powders and salts of said metal, and urea in the presence of a catalyst comprising ammonium chloride and ammonium molybdate in a nitrobenzene reaction medium, and

b. recovering the desired metal 4,4',4'',4'''-tetracarboxylic phthalocyanine from the reaction mixture by,

b.1. washing the reaction mixture with methanol to give a washed product,

b.2. boiling the washed product in aqueous mineral acid to give an acid-wash product,

b.3. treating the acid wash product with inorganic hydroxide at elevated temperature until ammonia evolution ceases and a soluble product results,

b.4. precipitating the desired metal 4,4',4'',4'''-tetracarboxylic phthalocyanine as a solid from the soluble product, and

b.5. isolating and washing the solid metal 4,4',4'',4'''-tetracarboxylic phthalocyanine with methanol and drying.

4,522,756

ALKYL, AZIDO, NITRO ETHERS AND METHOD OF PREPARATION

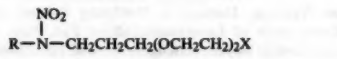
Carl J. Schack, Chatsworth, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 28, 1983, Ser. No. 479,423

Int. Cl.³ C07C *117/00, 77/02*

U.S. Cl. 260—349 6 Claims

1. A family of compounds having the general chemical formula



wherein R is an alkyl group having from 1 to 10 carbon atoms and wherein X is selected from the group consisting of $-ONO_2$ and $-N_3$.

4,522,757

PROCESS FOR OXIDIZING A PHENOL TO A P-BENZOQUINONE

Chao-Yang Hsu, Media, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Tech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 436,492, Oct. 25, 1982, abandoned. This application Aug. 30, 1983, Ser. No. 527,892

Int. Cl.³ C07C *45/16, 49/64*

U.S. Cl. 260—396 R 17 Claims

1. In the process of oxidizing phenol or a substituted phenol to benzoquinone or a substituted benzoquinone with a copper salt catalyst selected from the group of halides and nitrates, the improvement which comprises promoting the catalyst with an oxide or hydroxide of a Group II A metal.

4,522,758

METHOD OF PREPARING 2-FLUORO-17β-ESTRADIOL

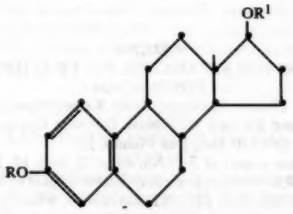
John S. Ward, and C. David Jones, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 22, 1983, Ser. No. 564,595

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.5 7 Claims

1. The method of preparing 2-fluoro-17β-estradiol which comprises (1) mercurating at C-2 with a mercurating agent in a mutual inert solvent, said mercurating agent and solvent being free from other halogens exchangeable with fluorine under the reaction conditions, a steroid of the structure



wherein R and R^1 are acid-stable hydroxyl protecting groups;

(2) reacting said 2-mercurated derivative with acetyl hypofluorite in a mutual inert solvent, thereby replacing said mercury containing group at C-2 with fluorine to yield a 2-fluoro-17β-estradiol having acid-stable hydroxy-protecting group at the 3 and 17β-hydroxyls; and

(3) then removing said hydroxyl protecting groups.

4,522,759

POLYPRENYLCARBOXYLIC ACID AMIDES

Isao Yamatsu; Takeshi Suzuki, both of Ushikumachi; Shinya Abe, Kukisaki; Akiharu Kajiwara, Ibaragi, and Kiichiro Ota, Wakayama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

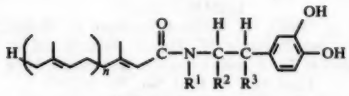
Filed Apr. 11, 1983, Ser. No. 484,111

Claims priority, application Japan, Apr. 13, 1982, 57-60310

Int. Cl.³ C11C *3/00;* A61K *31/165*

U.S. Cl. 260—404 6 Claims

1. Polyprenylcarboxylic acid amides of the general formula:



wherein R^1 represents a hydrogen atom or a lower alkyl group, R^2 represents a hydrogen atom or a group of the formula: $-COOR^4$ in which R^4 represents a lower alkyl group, R^3 represents a hydrogen atom or an OH group and n represents an integer of 1 to 6.

4,522,760

RECOVERY OF PALLADIUM VALUES FROM CARBONYLATION REACTION MEDIUM

Jean Jenck, Villeurbanne, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Jul. 23, 1982, Ser. No. 401,394

Claims priority, application France, Sep. 16, 1981, 81 17463

Int. Cl.³ C11C *3/02*

U.S. Cl. 260—410.9 R 23 Claims

1. A process for the separation of palladium values from the products of reaction resulting from the alkoxycarbonylation of a conjugated diene with carbon monoxide in the presence of an alcohol, hydrochloric acid or a compound capable of releasing

hydrochloric acid and a palladium catalyst to prepare esters of β,γ-unsaturated carboxylic acid, comprising (i) contacting the carbonylation reaction medium with a nitrogen, phosphorus or arsenic quaternary onium salt, a polar alcohol and an apolar, aliphatic or cycloaliphatic hydrocarbon solvent, and permitting the resulting admixture to phase separate into an alcohol phase and an organic phase; (ii) decanting/separating said alcohol phase from said organic phase; (iii) recovering the palladium values and the quaternary onium salt from said alcohol phase; and (iv) recovering the products of carbonylation from said organic phase.

4,522,761

PROCESS FOR SEPARATING FATTY ACIDS FROM ROSIN ACIDS

Michael T. Cleary, Elmhurst; Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 407,672, Aug. 12, 1982, Pat. No. 4,404,145, which is a continuation-in-part of Ser. No. 333,250, Dec. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 297,453, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 252,745, Apr. 10, 1981, Pat. No. 4,329,280. This application Mar. 14, 1983, Ser. No. 474,999

The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.

Int. Cl.³ C11C *1/08*

U.S. Cl. 260—419 **11 Claims**

1. A process for separating a fatty acid from a feed mixture comprising a fatty acid and a rosin acid, said process comprising contacting said feed mixture at separation conditions with a molecular sieve comprising silicalite, thereby selectively retaining said fatty acid, and removing rosin acid from the fatty acid containing molecular sieve, said fatty acid being recovered from said molecular sieve by displacement at displacement conditions with a displacement fluid comprising an aqueous solution of a ketone from the group comprising acetone, methyl-ethyl ketone, or di-ethylketone.

4,522,762

DIISOCYANATE

Richard W. Oertel, III, Guilford; Reinhard H. Richter, North Haven, and Benjamin W. Tucker, Bethany, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 10, 1982, Ser. No. 440,565

Int. Cl.³ C07C *69/00*; C08G *18/10*

U.S. Cl. 260—453 A **1 Claim**

1. 1,4-bis-(2-isocyanatoethyl)cyclohexane.

4,522,763

N-ALKOXYCARBONYL- AND N-ALKOXYTHIOCARBONYL-AMIDINES AND THEIR PREPARATION

Gerhard Hamprecht, Weinheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

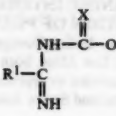
Filed Jul. 14, 1982, Ser. No. 398,421

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134144

Int. Cl.³ C07C *155/02, 125/06, 125/04*

U.S. Cl. 260—455 A **28 Claims**

1. A process for the preparation of an N-alkoxycarbonyl- or N-alkoxythiocarbonyl-amidine of the formula



I

where R^1 is hydrogen or an aliphatic, cycloaliphatic or araliphatic radical, R^2 is an aliphatic radical and X is oxygen or sulfur, wherein an amidine of the formula

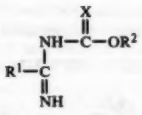
II

where R^1 has the above meanings, or an amidine salt thereof, is reacted with an ester of chlorocarbonic acid or chlorothiocarbonic acid of the formula

III

where R^2 and X have the above meanings, in the presence of an inorganic acid acceptor and a 2-phase mixture of water and organic solvent at from 0° to 60° C.

2. An N-alkoxycarbonyl- or N-alkoxythiocarbonylamidine of the formula



I

where R^1 is hydrogen or a C_1-to-C_{16} aliphatic, cycloaliphatic or araliphatic radical, R^2 is a C_1-to-C_5 aliphatic radical and X is oxygen or sulfur.

4,522,764

PROCESS FOR THE PRODUCTION OF α, β-UNSATURATED CARBOXYLIC ACID ALKYL ESTERS SULFONATED IN THE α-POSITION AND COMPOUNDS OBTAINABLE BY THIS PROCESS

Theo Neukam, Dormagen; Wolfgang Bräuer, and Siegfried Korte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

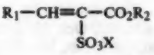
Division of Ser. No. 396,567, Jul. 9, 1982, abandoned. This application Jul. 26, 1983, Ser. No. 517,483

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1981, 3129980

Int. Cl.³ C07C *143/68*

U.S. Cl. 260—456 R **7 Claims**

1. A process for the production of compounds corresponding to the following formula:



in which

R_1 represents a hydrogen atom,

R_2 represents a primary or secondary alkyl group containing from 1 to 4 carbon atoms and

X represents a hydrogen atom, a primary or secondary alkyl group containing from 1 to 4 carbon atoms, comprising

reacting α,β-unsaturated carboxylic acid esters corresponding to the following general formula:

$$R_1CH{=}CH{-}CO_2R_2$$

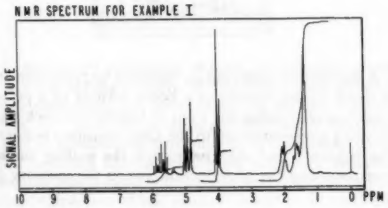
in which R_1 and R_2 are as defined above, with from 0.6 to 1.6 mol. equivalents of sulfur trioxide and, optionally, with from 0.1 to 10 mol. equivalents of an alkylating agent, based in each case on the unsaturated ester, at temperatures in the range from $-10°$ C. to $+25°$ C., heating the reaction mixture to temperatures in the range from 70° to 200° C. then working up by distillation, and optionally separating the components of the distillate.

4,522,765

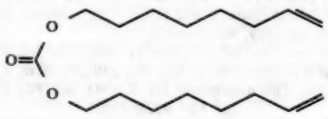
DI(7-OCTENYL) CARBONATE

Wilhelmus J. Wiegers, Red Bank, N.J.; Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Luccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J., and Manfred H. Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 511,909, Jul. 8, 1983, Pat. No. 4,490,544.
This application Jun. 22, 1984, Ser. No. 623,445
Int. Cl.³ C07C *69/96*; A61K *7/46*
U.S. Cl. 260—463 **1 Claim**



1. The compound having the structure:

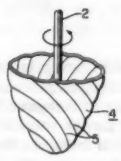


4,522,766

GAS-LIQUID CONTACTING DEVICE

Satoshi Sunada, 11-8, Minami Ohashi 1-chome, Minami-ku, City of Fukuoka, Fukuoka Prefecture, Japan

Filed Nov. 15, 1982, Ser. No. 441,623
Claims priority, application Japan, Nov. 20, 1981, 56-187417
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—91 **4 Claims**



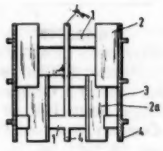
1. A gas liquid contacting device comprising a frame, a driving means mounted to said frame, a vertical rotating shaft rotatably mounted to said frame and adapted to be driven by said driving means, and a rotor adapted to be rotated by said vertical rotating shaft, said rotor being substantially a body of rotation the axis of which coincides with that of said vertical rotating shaft, said rotor being adapted to be partially or entirely immersed into said liquid to splash the liquid in the form of a substantially continuous thin film or fine particles; said rotor having substantially the shape of an inverted cone, and being formed on its outer periphery with a number of equally spaced spiral grooves which spiral backward relative to the direction of rotation from the lower end towards the upper end, of the rotor with a relatively large angle relative to the vertical axis of the rotor whereby a corresponding number of outwardly protruding spiral surfaces are formed between adjoining spiral grooves, said outwardly protruding spiral surfaces having a smoothly curved cross section contour between said grooves to avoid sharp edges on surfaces between said grooves.

4,522,767

ANNULAR FILLING MEMBER FOR GAS-LIQUID CONTACT

Reinhard Billet, Bochum; Rainer Kober, Steinwiesen; Jerzy Makowiak, Bochum, and Werner Geipel, Steinwiesen, all of Fed. Rep. of Germany, assignors to Paul Rauschert GmbH & Co. KG, Pressig, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,556
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 32211287
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—94 **19 Claims**



1. An annular filling member for gas-liquid contact comprising at least one annular rib having spaced apart drain plates arranged thereon projecting generally radially into the interior of the annular configuration and terminating in said interior, such that said drain plates extend at least in part as a sharp-edge configured plate portion for from about one-third to about four-fifths of the axial dimension of the filling member and over the remainder of the axial dimension of the filling member in the form of drain web portions, said sharp-edge configured plate portions starting alternately at one end and the other end and terminating alternately respectively before said other end and said one end of the axial dimension of the filling member.

4,522,768

CASTING GASKET ASSEMBLY AND METHOD FOR CASTING LENSES THEREFROM

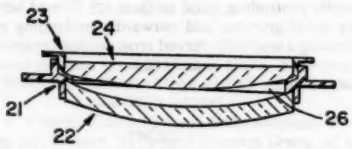
Harold N. Roscrow, North Adelaide; Ronald W. Ewer, Coromandel Valley, and Philip H. Squires, Reynella, all of Australia, assignors to Sola Products Limited, Kowloon, Hong Kong

Filed Apr. 11, 1980, Ser. No. 139,210
Claims priority, application Canada, May 11, 1979, 327467
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—2.2 **14 Claims**

1. A method of casting an optical lens with a pair of dies having curved casting surfaces, comprising the steps of placing one of said dies in a first gasket member, locating said first die at the desired angular orientation with respect to said first gasket member, providing a second gasket member adapted to receive the other die, assembling said gasket members so as to be able to orient properly said other die with respect to said

first die, inserting said other die in said second gasket member in a predetermined angular orientation therewith and in confronting relationship with said first die, introducing a non-form-retaining optical casting composition between said confronting die surfaces and curing said casting composition to form a lens.

4. A lens casting gasket assembly for casting lenses between two dies, one having a spherical molding surface and the other having a toroidal molding surface, comprising a first gasket member having a first central passage therein, one end of said passage including first means to receive said one of said dies in



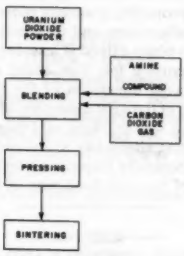
mating relationship, said first means including means for introducing prism into said lens, a second gasket member having a central passage therein, a portion of said central passage including second means to receive said other of said dies in mating relationship, means for joining said gasket members together with said dies disposed in confronting, spaced relationship, said dies and gasket members defining a closed lens casting cavity, means for selectively varying the axis of said toroidal molding surface, including means for joining said gasket members in mating relationship at an angle about the axis of said central passage.

4,522,769

METHOD FOR THE MANUFACTURE OF NUCLEAR FUEL PRODUCTS

John D. Connolly, Jr.; Timothy J. Gallivan, both of Wilmington, and Richard P. Ringle, Scotts Hill, all of N.C., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 24, 1982, Ser. No. 410,977
Int. Cl.³ G21C *21/00*
U.S. Cl. 264—0.5 **13 Claims**



1. A method of producing coherent compacts of particulate ceramic nuclear fuel material whereby the ceramic material is rendered more plastic and amenable to processing, consisting essentially of the sequence of steps of:

(a) adding a fugitive binder consisting essentially of at least one amine selected from the group consisting of ethylene diamine, 3.3 diaminodipropylamine, 1.3 diaminopropane, 1.6 diaminohexane, 1.7 diaminoheptane, diethylenetriamine, and 3-dimethylaminopropylamine to particulate nuclear fuel material of uranium dioxide and blending the binder therethrough;

(b) thereafter introducing carbon dioxide gas into the blend of particulate fuel material and amine binder; and

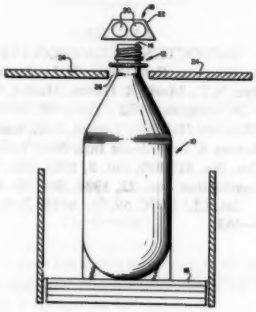
(c) pressing the resultant blend comprising particulate fuel material and amine binder having had the carbon dioxide gas introduced therein into a coherent compact.

4,522,770

METHOD FOR RESTORING DENTED AREAS IN BOTTLE NECK FINISH

Jorn W. Andersen, Nashua, N.H., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Mar. 11, 1982, Ser. No. 357,350
Int. Cl.³ B29C *17/00*
U.S. Cl. 264—36 **7 Claims**



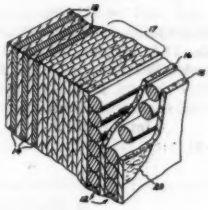
1. A method of removing an indented imperfection from a neck finish sealing surface of a bottle formed of a polyester, said method comprising the steps of heating the neck finish to an elevated temperature up to the glass transition temperature of the polyester and then permitting the sealing surface to reform removing the imperfection due to the memory of the polyester.

4,522,771

METHOD OF FABRICATING LAYER INSULATION FOR USE IN HIGH-VOLTAGE ELECTRICAL EQUIPMENT

Joseph R. McLoughlin, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 435,856, Oct. 21, 1982, Pat. No. 4,410,585, which is a continuation of Ser. No. 239,296, Mar. 2, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,534
Int. Cl.³ B32B *7/02*
U.S. Cl. 264—61 **17 Claims**



1. The method of fabricating layer insulation for use in high-voltage electrical equipment, consisting essentially of:

(a) applying a mixture of inorganic particles, inorganic cement, and a fluid carrier vehicle for said cement to an intermingled array of inorganic fibers;

(b) pressing the product of (a) into a single layer having a generally planar configuration, said inorganic fibers reinforcing said layer to bond said inorganic particles together and the said inorganic fibers with said inorganic cement; and

(c) removing said fluid carrier vehicle from said layer.

4,522,772

MOULDING OF ARTICLES

Christopher G. Bevan, London, England, assignor to C. G. Bevan Associates Limited, London, England

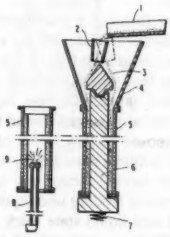
PCT No. PCT/GB81/00002, § 371 Date Sep. 4, 1981, § 102(e) Date Sep. 4, 1981, PCT Pub. No. WO81/01979, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 5, 1981, Ser. No. 302,472

Claims priority, application United Kingdom, Jan. 7, 1980, 8000421

Int. Cl.³ B28B *1/26*

U.S. Cl. 264—71 13 Claims



1. A method of producing molded construction products from a liquid-setting mixture of fine and coarse particulate materials comprising the steps of mixing the dry constituent materials, said materials including a proportion of fine particles sufficient to substantially surround all of the coarse particles but not including fibrous reinforcing materials, introducing said mixture into a mold, vibrating at least a part of said mold to effect compaction of said mixture in said mold to an extent that said fine particles substantially fill the interstices between said coarse particles and that any vertical surface of said product will stand and be self-sustaining upon being exposed without mold support, removing at least a part of the mold from contact with the thus compacted product, thereby exposing at least one vertical surface of the compacted product, spraying the product at a surface unsupported by said mold with a predetermined quantity of a setting liquid, said quantity being sufficient to wet all of the compacted constituents so as to initiate a chemical setting reaction but insufficient to completely saturate the compacted product and to cause the associated effect of structural collapse of the compacted product in the region of said exposed surface, and allowing said product to set.

4,522,773

PROCESS FOR PRODUCING SELF-CRIMPING POLYESTER YARN

Edgar V. Menezes, Somerville, N.J.; John H. Southern, Pensacola, Fla.; Richard L. Ballman, Gulf Breeze, Fla., and J. M. Chamberlin, Pensacola, Fla., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 24, 1983, Ser. No. 469,326

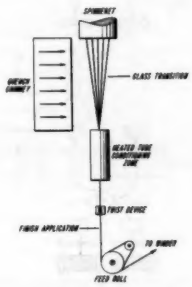
Int. Cl.³ D02G *1/20*

U.S. Cl. 264—167 27 Claims

1. A process for expeditiously forming and structurally modifying a latently self-crimping polyester yarn comprising a plurality of polyester filaments having thick and thin regions along their lengths which are out of phase from filament to filament, which filaments are generated by the steps comprising:

(i) forming a plurality of combined streams of melt spun polyester by combining at least first and second extruded molten streams of fiber forming polyester travelling at different extrusion speeds to form thick and thin regions in the combined streams out of phase from other combined streams:

(ii) quenching the combined streams to thereby transform same into solid filaments having thick and thin regions along their lengths out of phase from filament to filament in a solidification zone provided with a gaseous atmosphere at a temperature below the glass transition temperature of the polyester;



(iii) passing the resulting filaments in the direction of their lengths through a conditioning zone provided with a gaseous atmosphere at a temperature sufficient to decrease the percentage yarn shrinkage of said resulting filaments and to produce polyester filaments which exhibit a percentage yarn shrinkage in the range of from about 10 to about 45 percent; and

(iv) withdrawing the resulting filaments from the conditioning zone at a substantially constant wind-up speed in the range of from about 2200 to about 4400 yards per minute.

4,522,774

INTEGRATED PROCESS FOR THE PRODUCTION OF TEXTURED POLYCAPROLACTAM MULTIFILAMENT YARN

Edward N. Donnelly, Anderson, S.C.; Wilhelm A. Haberkorn, Williamsburg, Va.; Gerry A. Hagen, Anderson, S.C.; Thomas R. McGregor, Anderson, S.C., and William Postman, Anderson, S.C., assignors to Badische Corporation, Williamsburg, Va.

Continuation-in-part of Ser. No. 272,820, Jun. 11, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,822

Int. Cl.³ D01D *5/16, 5/22*

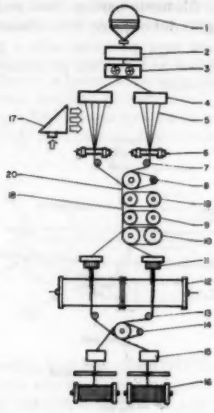
U.S. Cl. 264—168 10 Claims

1. In the integrated process for the production of textured multifilament yarn from a fiber-forming, thermoplastic, linear, high-molecular-weight polymer of caprolactam by the combination in immediate succession of the procedural steps of melt spinning, drawing, texturing and packaging: the improvement therein which comprises the cooperative combination of the following procedural steps with those of melt spinning, drawing, texturing, and packaging:

(a) Lubricating the filamentary polymeric material from the melt spinning step by applying thereto a lubricating composition comprising (1) a lubricant and (2) solvent in an amount of from 0 to 20 percent by weight of the lubricating composition;

(b) Pre-tensioning the lubricated melt spun filamentary polymeric material beyond its elastic limit between a first godet

at room temperature, viz. between about 15° and 25° C. followed by



(c) Pre-heating the pre-tensioned filamentary polymeric material on a second godet to a temperature between about 40° and 70° C. prior to the drawing thereof.

4,522,775

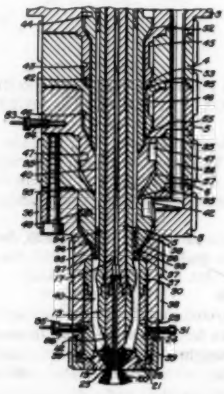
APPARATUS AND METHOD FOR PRODUCING MULTILAYERED LAMINATES

Jerald E. Briggs, St. Charles, Ill., and Henry Pfeutzenreuter, Alta Loma, Calif., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 354,636, Mar. 4, 1982, abandoned. This application Nov. 29, 1982, Ser. No. 445,261

Int. Cl.³ B29D *23/04*

U.S. Cl. 264—173 **17 Claims**



1. An apparatus for producing multi-layer parisons of polymeric materials wherein at least two of said layers are relatively thin compared to at least one other layer, said apparatus comprising means including a tubular channel for forming a relatively thick layer of a first polymeric material and laminate means for forming a laminate of at least two thin layers which is thereafter fed completely around the surface of the thick layer of polymeric material, said laminate means including a segmented die block, each segment being formed with a polymeric accumulation reservoir, the die block being formed around said tubular channel having a first annular passageway of lesser diameter than said tubular channel leading from an accumulation reservoir in a first segment to an outlet orifice and adapted to be charged with a second polymeric material from said accumulation reservoir, a second annular passageway leading from an accumulation reservoir in a second segment to an outlet orifice and adapted to be charged with a third polymeric material from said accumulation reservoir, and a third annular passageway which is an elongated annular member having facing and spaced apart parallel side walls in which said laminate is formed leading from the outlet orifices of said first and second passageways and leading to said tubular channel; whereby a laminate can be formed in said third annular passageway composed of said second and third polymeric material, which laminate is thereafter fed around said first polymeric material.

17. A method of forming a multilayer parison of at least three layers of polymeric materials by co-extrusion with an extrusion head wherein at least two of said layers are relatively thin compared to at least one other layer comprising the steps of forming the thick layer of a first liquid state polymeric material within a tubular passageway and forming a liquid state flow laminate composed of thin layers of a second and third polymeric material within a passageway which is an elongated annular passageway having facing and spaced apart parallel side walls and thereafter feeding said liquid state flow laminate completely around said liquid state thick layer prior to extrusion from said head.

4,522,776

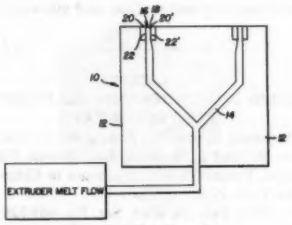
PROCESS FOR SUBSTANTIALLY ELIMINATING SURFACE MELT FRACTURE WHEN EXTRUDING ETHYLENE POLYMERS

Arakalgud V. Ramamurthy, Somerset, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1983, Ser. No. 508,668

Int. Cl.³ B29F *3/04*

U.S. Cl. 264—176 R **6 Claims**



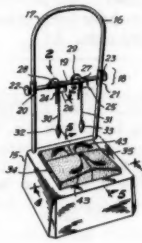
1. A process for substantially eliminating surface melt fracture during extrusion of an ethylene polymer under adhesion conditions between the material constituting a conventional die land surface and the polymer, which would otherwise produce higher levels of melt fracture which comprises extruding said polymer through a die having a die land surface fabricated from a material other than a conventional die land material which increases adhesion between the die land surface and the polymer to an extent sufficient to substantially eliminate surface melt fracture.

4,522,777

METHOD AND APPARATUS FOR MAKING CORRECTED CUSTOM FOOT MOLDS

William Peterson, Lake Placid, N.Y., assignor to Peterson Laboratories, Lake Placid, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,978
Int. Cl.³ B29C 17/00; B29D 31/00
U.S. Cl. 264—223 12 Claims



1. In apparatus for producing a corrected mold for a foot having a rear portion and a forefoot portion with a ball portion, said apparatus comprising:

resilient cushion means for substantially immobilizing the ball portion and providing a floating action for the rear portion thereof when said foot is supporting its respective portion of full body weight, said resilient cushion means having a rear section with a first thickness for supporting said rear portion and a front section with a second, smaller thickness for supporting said forefoot portion, said rear section being deformable throughout the entire first thickness thereof to provide the floating action, the second thickness being sufficiently small such that said ball portion completely compresses said front section at the respective position of the ball portion to provide said substantial immobilization, wherein the position of the rear portion of the foot on the resilient cushion means is adjusted so that said resilient cushion means adopts a corrected contour of the foot; and

molding means positioned between said foot and said resilient cushion means for producing said corrected mold once said foot has been so adjusted.

9. A method for producing a corrected mold for a foot having a rear portion and a forefoot portion with a ball portion, said method comprising the steps of:

substantially immobilizing the ball portion of said foot when said foot is supporting its respective portion of full body weight by supporting the foot on resilient cushion means having a rear section with a first thickness for supporting said rear portion and a front section with a second, smaller thickness for supporting said forefoot portion, the second thickness being sufficiently small such that said ball portion completely compresses said front section at the respective position of the ball portion to provide said substantial immobilization;

supporting the rear portion of the foot on said rear section in a floating manner with said rear section being deformable throughout the entire first thickness thereof to provide the support in said floating manner;

adjusting the position of the rear portion of the foot on said resilient cushion means so that said resilient cushion means adopts a corrected contour of the foot; and

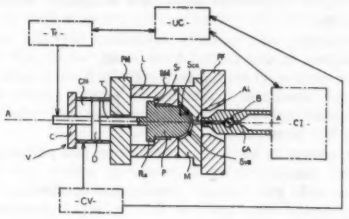
making a mold of said adjusted foot from molding means positioned between said foot and said resilient cushion means.

4,522,778

METHOD AND APPARATUS FOR THE INJECTION MOULDING OF PLASTICS ARTICLES

Antoine Baciu, Anbevoye; Jean M. Rius, Romainville, and Bernard Sivry, Paris, all of France, assignors to Cibie Projecteurs, France

Filed Apr. 27, 1984, Ser. No. 604,738
Claims priority, application France, Apr. 28, 1983, 83 07029
Int. Cl.³ B29F 1/06
U.S. Cl. 264—328.7 11 Claims



1. A method of producing a part from a plastics material, using an injection press including a mould member having a cavity, a piston, and an injection inlet leading along an injection axis to said mould cavity, said mould cavity being defined by two principal surfaces facing each other, one of said principal surfaces consisting of a surface of said piston and the opposite said principal surface consisting of a surface of said mould member, said piston being movable relative to said mould member to vary the volume of said mould cavity; said method comprising:

injecting a plastics material into said mould cavity to form a parison in an injection stage,

immobilising said piston during said injecting stage at a short distance from said opposite principal surface thereby forming a rough model of said parison, said model being symmetrical about said injection axis and having identical contact diameters on each of said two principal surfaces,

subsequently retracting said piston, still during said injection stage, thereby distancing said piston from said opposite principal surface, said retraction being effected at such a speed that on the one hand said rough model is not reduced in diameter and on the other hand the contact diameters of said rough model on each of said principal surfaces are constantly equal to each other and have values between a constant value and an increasing linear variation, as a function of the thickness of said rough model,

moving said piston towards said opposite principal surface thereby compressing said parison to shape said part into its final form.

4,522,779

METHOD FOR PRODUCTION OF POLY(ETHYLENE TEREPHTHALATE) ARTICLES

Saleh A. Jabarin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1983, Ser. No. 555,759
Int. Cl.³ B29C 17/07
U.S. Cl. 264—530 8 Claims

1. A process for fabricating a partially crystalline, biaxially oriented hollow plastic container article comprising:

(1) enclosing a plastic parison which is at a temperature within its molecular orientation temperature range within a first blow which first blow mold is at a temperature sufficient to induce crystallization into said plastic upon contact of said plastic with said blow mold;

(2) expanding said plastic parison within said first blow mold by internal pressurization while still within the molecular orientation temperature range to induce biaxially orient-

ing in said plastic and force said plastic parison into intimate contact and conformance with said first blow mold to form a biaxially oriented container and by such internal pressurization maintaining contact between said first mold and said biaxially oriented container for a time sufficient to induce partial crystallization into said biaxially oriented container;

(3) transferring said partially crystallized, biaxially oriented container from said first blow mold to a second blow mold, said transfer occurring with sufficient internal pressurization of said partially crystallized biaxially oriented container to prevent significant shrinkage during said transfer;

(4) enclosing said partially crystalline biaxially oriented container in said second blow mold, which said second blow mold is (a) at a temperature which is not sufficient to induce significant crystallization in said plastic of said container and (b) which is larger in internal volume than said first blow mold;

(5) expanding by internal pressurization said partially crystalline biaxially oriented container within said second blow mold into intimate contact and conformance with said second blow mold to form a larger container and again biaxially orient the material of said partially crystallized biaxially oriented container derived from said first blow mold; and

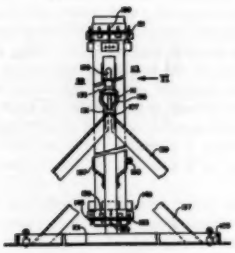
(6) subsequently removing the resultant container from said second blow mold and reducing the internal pressure to ambient pressure.

4,522,780

REMOVAL AND REPLACEMENT OF FUEL RODS IN NUCLEAR FUEL ASSEMBLY

John M. Shallenberger, O'Hara Township, Allegheny County, and Stephen J. Ferlan, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1982, Ser. No. 349,126
Int. Cl.³ G21C *14/00*
U.S. Cl. 376—260 **39 Claims**



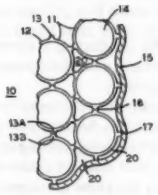
37. The method of removing from a nuclear fuel assembly a nozzle, said nozzle including a nozzle plate, said assembly having control rod thimbles secured to said plate by screw-fasteners having lock-pins welded to the nozzle plate, said method being practiced with apparatus including a bushing plate to be mounted on said nozzle, said bushing plate having a plurality of bushings positioned so that when said bushing plate is mounted on said nozzle each of said bushings encircles a screw fastener and seals the region around said screw fastener, the said apparatus also including an eductor including a suction tube for impressing a suction force; the said method including mounting said bushing plate on said nozzle with each of said bushings encircling a screw-fastener and sealing the region around said each screw fastener, severing the weld of each said screw fastener whereby the chips resulting from said severing of each weld are captured in the region sealed by the associated bushing, injecting said suction tube into each bushing and enabling said eductor to suck said chips out of the associated sealed region of the bushing in which said suction tube is injected; collecting said chips in a region from which the radioactive radiation from said chips is suppressed, after said chips have been removed unscrewing the screw fastener from each said control-rod thimble, thereafter injecting the suction tube in each said bushing and enabling said eductor to capture each said screw fastener in said suction tube, removing said suction tube from each bushing with each screw fastener in its turn attached thereto, with said eductor enabled, removing said screw fasteners to a region from which the radioactive radiation of screw fasteners are suppressed, disabling said eductor to deposit each screw fastener in said last-named region and after all said screw fasteners have been collected removing said nozzle from said bushing plate.

4,522,781

INTEGRAL NUCLEAR FUEL ELEMENT ASSEMBLY

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 816,401, Jul. 18, 1977, abandoned. This application Dec. 4, 1981, Ser. No. 327,537
Int. Cl.³ G21C *3/30, 3/06*
U.S. Cl. 376—427 **9 Claims**



1. In a pressurized water moderated and cooled fast breeder nuclear reactor, a fuel assembly comprising a nuclear fuel and a plurality of fuel pins disposed with parallel longitudinal axes in a closely packed array, each fuel pin consisting essentially of a generally tubular cladding bearing said nuclear fuel and a longitudinally extending fin extending from said cladding to each juxtaposed fuel pin and bonded metallurgically thereto to form an integral fuel assembly having coolant passages which are defined by said cladding surface and said fins and which are unobstructed by spacer grids, and said fuel pins including said fins are sized such that the fuel assembly has a structural volume fraction less than about 0.166 and a fuel to coolant volume fraction ratio in the range between about 2.43 and about 3.20.

4,522,782

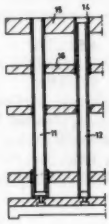
FUEL ASSEMBLY FOR A NUCLEAR REACTOR

Joseph Leclercq, Saint-Didier, France, assignor to Framatome & Cie., Courbevoie, France

Filed Sep. 27, 1982, Ser. No. 424,772
Claims priority, application France, Oct. 5, 1981, 81 18670
Int. Cl.³ G21C *3/32*
U.S. Cl. 376—438 **7 Claims**

1. Fuel assembly for a nuclear reactor constituted by a bundle of parallel fuel rods whose spacing is maintained by spacer grids which are transverse with respect to said rods, two transverse end plates and supporting guide tubes which replace some fuel rods and which are longer than said fuel rods, rigidly fixed to said end plates and to said spacer grids for assuring retention of said spacer grids, rigidity of the assembly and taking up of axial forces as well as guiding control rods of said reactor, said end plates being made of stainless steel, wherein at least two supporting guide tubes made of material which is metallurgically compatible with the material of said spacer grids are welded to the latter, while other guide tubes which also guide control rods of said reactor constituting the majority of the guide tubes of said assembly are made of zirconium alloy

and are secured to only one of said end plates and slip-fitted on the cells of said spacer grids so as to be movable with respect



thereto under the effect of expansion and assuring only the guidance of said control rods.

4,522,783

METALLIC ALLOYS TO BE USED IN DENTISTRY

Gian F. Menicucci, Via Maggi, 110, Leghorn, Italy

Filed May 11, 1983, Ser. No. 493,751

Claims priority, application Italy, May 14, 1982, 48429 A/82

Int. Cl.³ C22C *5/02, 5/08*

U.S. Cl. 420—503 **15 Claims**

1. A metallic dental alloy containing at least one crystal face-centered cubic lattice wherein each lattice contains 14 atoms of metal and herein each lattice has 1 atom of copper, 1 or 2 atoms of palladium, 9, 10 or 11 atoms of silver and 1 or 2 atoms of gold.

4,522,784

CASTING METALS

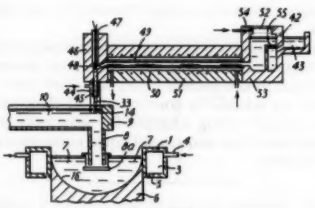
Philip G. Enright, Hook Norton; Ian R. Hughes, Banbury, and Richard M. Jordan, Hook Norton, all of England, assignors to Alcan International Limited, Montreal, Canada

Filed Apr. 27, 1983, Ser. No. 489,094

Claims priority, application United Kingdom, May 4, 1982, 8212837

Int. Cl.³ C22C *1/00, 32/00*

U.S. Cl. 420—590 **18 Claims**



1. A method of producing metal alloys which comprises mixing a minor proportion of a relatively hot molten alloy with a major proportion of a relatively cool molten metal which is at a temperature below the liquidus temperature of the relatively hot molten alloy to precipitate precipitatable intermetallic particles or selected phases from the relatively hot molten alloy by contact with said relatively cool metal, dispersing the hot alloy through the relatively cool metal and chilling the mixture to solidify the same in a selected time period such that total re-solution of precipitated particles or phases is avoided.

4,522,785

DIALKYLAMINOMETHYL AROMATIC TRIAZOLES AS CORROSION INHIBITORS

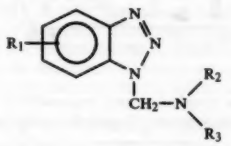
Michael J. D'Errico, Flossmoor, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Nov. 4, 1982, Ser. No. 439,110

Int. Cl.³ C23F *11/04*

U.S. Cl. 422—12 **16 Claims**

10. A process for minimizing the corrosion of steel in contact with an aqueous acid solution which process comprises adding to the aqueous acid solution about 1 to about 50,000 parts by weight per 1 million parts of the aqueous acid solution, a dialkylaminomethyl aromatic triazole having the structure:



wherein R_1 is from 1 to 4 substituents and is hydrogen, aliphatic of 1 to about 12 carbons, alkoxy of 2 to about 10 carbons, aroxy of 2 to about 10 carbons, or —$COOR_4$ wherein R_4 is aliphatic of 1 to about 12 carbons; and R_2 and R_3 are the same or different and are alkyl of 1 to about 4 carbons.

4,522,786

MULTILAYERED TEST DEVICE FOR DETECTING ANALYTES IN LIQUID TEST SAMPLES

Richard C. Ebersole, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1983, Ser. No. 521,687

Int. Cl.³ G01N *21/78, 33/52*

U.S. Cl. 422—56 **12 Claims**

1. In a multilayered test device for the assay of analytes in test liquids, said device comprising at least two liquid permeable functional layers superposed upon one another, said layers being in liquid communication, the improvement comprising:

a barrier layer separating said layers, said barrier layer comprising a chemically inert, liquid insoluble, foraminous septum, the foramina of which are filled with a thermally sensitive material which is liquid impermeable at assay temperature, but capable of melting when heated, thereby providing rapid liquid communication between said functional layers.

4,522,787

ASH FUSION SYSTEM

Larry S. O'Brien, St. Joseph, and Ward S. Kaler, Benton Harbor, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 5, 1982, Ser. No. 355,171

Int. Cl.³ G01N *31/12*

U.S. Cl. 422—78 **28 Claims**

1. An analyzer furnace comprising:

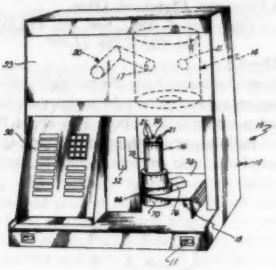
a furnace defining a chamber;

radiation responsive detection means for detecting radiation along a line oriented in a first direction and producing signals responsive to an image focused thereon;

means for projecting the image of a portion of said furnace chamber onto said detection means;

means for supporting a plurality of samples within said furnace chamber and for repeatedly conveying said samples individually through said chamber portion in such manner to cause the individual images of said samples to be repeatedy projected across said detection means in a

second direction generally perpendicular to said first direction; and



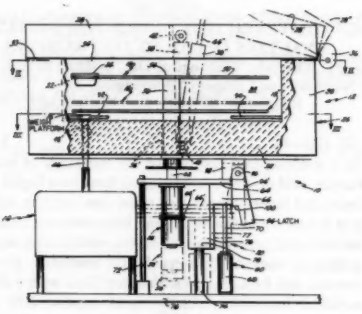
circuit means coupled to and responsive to said detection means for determining shape information of each sample.

4,522,788

PROXIMATE ANALYZER

George J. Sitek, and Sherman L. Walker, both of Stevensville, Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 5, 1982, Ser. No. 355,221
Int. Cl.³ G01N *31/12*
U.S. Cl. 422—78 **8 Claims**



1. A fossil fuel proximate analyzer comprising:

a furnace;

a balance having a weigh platform positioned in said furnace;

support means for supporting a plurality of crucibles in a generally horizontal, circular configuration, each of the crucibles holding a sample of a material to be analyzed;

oxygen line means for selectively flooding said furnace with oxygen to facilitate oxidation of the samples during analysis, said oxygen line means including a first end to be coupled to an oxygen source, a second end communicating with said furnace, and a valve means between said first and second ends for controlling the flow of oxygen through said line means;

rotation means for rotating said support means to sequentially vertically align the crucibles with said weigh platform;

elevator means for vertically shifting said support means to deposit and remove the aligned crucible on and from said weigh platform;

control means for controlling said rotation means and said elevator means to repeatedly weigh the crucibles sequentially;

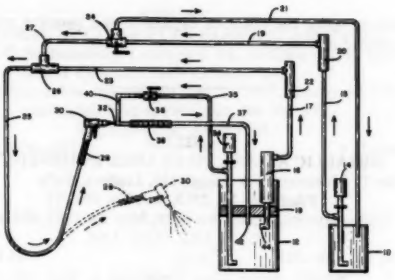
circuit means connected to said balance for monitoring the weights of the crucibles to monitor the weights of the samples, said circuit means including means for determining when the weights of the samples have reached a generally constant value indicating that a proximate analysis step is complete.

4,522,789

PLURAL COMPONENT MIXING AND DISPENSING SYSTEM

Lawrence S. Kelly, Bolingbrook; McCormick Marty P., Palatine, and William A. Weikel, Hanover Park, all of Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Sep. 6, 1983, Ser. No. 529,346
Int. Cl.³ B01F *5/05*; B08B *9/02*
U.S. Cl. 422—133 **8 Claims**



1. An apparatus for mixing and dispensing chemically reactive liquid components and for purging such mixed components from the apparatus, wherein such components become chemically reactive at predetermined volume ratios and remain substantially chemically inert at volume ratios substantially different from said predetermined ratios, comprising

(a) a first container for storing a quantity of a first liquid component and first means for delivering said first liquid from said container to a first mixing means;

(b) a second container for storing a quantity of a second liquid component and second means for delivering said second liquid from said container to said first mixing means;

(c) a first mixing means for receiving said first and second liquid components

(d) a dispensing means connected to said first mixing means, said dispensing means having a nozzle for emitting mixed first and second liquids;

(e) third means for selectively delivering said second liquid component from said second container to a second mixing means;

(f) a second mixing means comprising a mixing manifold and including return coupling means to deliver mixed components back to said second liquid container; and

(g) means for selectively connecting said dispensing means nozzle to said mixing manifold for selectively permitting emitted mixed first and second liquid components to enter said manifold.

4,522,790

FLUX CONCENTRATOR

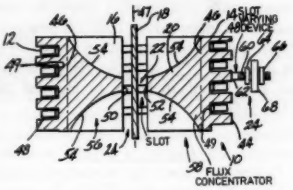
Jonathan A. Dantzig, Hamden, and John V. Patton, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 25, 1982, Ser. No. 361,940
Int. Cl.³ C30B *13/30, 21/02*
U.S. Cl. 422—246 **13 Claims**

1. A flux concentrator for generating a relatively strong magentic field, comprising:

inductor means for generating a primary magnetic field being weaker than said strong magnetic field; concentra-

tor body means having a hollow interior for receiving material to be acted upon by said strong magnetic field, said concentrator body means being located within said primary magnetic field for shielding said primary field from said hollow interior;



flux concentrator means within said hollow interior of said concentrator body means having a slot extending therethrough, said flux concentrator means being coupled to said primary magnetic field for generating said strong mangetic field within said slot; and

movable means for varying the size of said slot while said strong magnetic field is being generated in said slot.

4,522,791

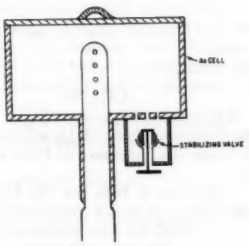
ARSENIC CELL STABILIZATION VALVE FOR GALLIUM ARSENIDE IN-SITU COMPOUNDING

Glenn H. Westphal, Dallas, and Jimmie B. Sherer, Greenville, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 2, 1982, Ser. No. 446,298

Int. Cl.³ C30B *15/00*

U.S. Cl. 422—249 **3 Claims**



1. A system for compounding gallium arsenide, comprising:

crucible means for holding a melt of gallium and gallium arsenide;

an arsenic sublimation cell, said sublimation cell comprising an arsenic vapor injection tube downwardly extending from an upper portion of said arsenic cell;

means for positioning said arsenic cell, so that said arsenic vapor injection tube extends into the interior of said crucible;

wherein said arsenic cell further comprises a stabilizing valve, said stabilizing valve comprising a ball check valve to prevent low relative pressure inside said arsenic cell.

4,522,792

PROCESS FOR OXIDIZING A GAS COMPRISING CARBON MONOXIDE OR AN HYDROCARBON

John F. Brennan, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 555,227, Nov. 25, 1983, Pat. No. 4,480,050, which is a continuation-in-part of Ser. No. 404,160, Aug. 2, 1982, abandoned. This application May 30, 1984, Ser. No. 615,429

Int. Cl.³ B01J *8/02*; B01D *53/36*; C01B *31/20*

U.S. Cl. 423—213.5 **4 Claims**

1. A process for the oxidation of a gas comprising carbon monoxide or a hydrocarbon which comprises contacting said gas at a temperature above 200° C. with a catalytic composite prepared by a method which includes the step of impregnating a refractory inorganic oxide porous carrier material with a catalytically active metallic component selected from the group consisting of platinum, palladium and rhodium whereby said component is dispersed on the peripheral surface of said carrier material the improvement which comprises, prior to said impregnation of said catalytically active netallic component

(a) impregnating said refractory inorganic oxide porous carrier material with an aqueous solution of a lithium salt of an organic acid such that said carrier material contains from 0.1 to 0.8 wt. % Li on an elemental basis,

(b) drying said carrier material, and

(c) calcining said carrier material.

4,522,793

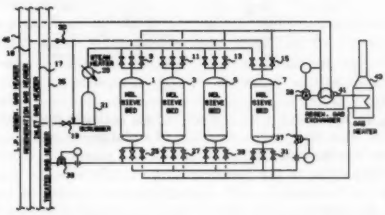
REMOVING H_2S FROM NATURAL GAS USING TWO-STAGE MOLECULAR SIEVES

Harold A. Larson; Manfred F. Boehme, and Jeffrey W. Sheets, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1983, Ser. No. 508,710

Int. Cl.³ C01B *17/00*; B01J *1/00*

U.S. Cl. 423—230 **6 Claims**



1. An integrated process for removal of hydrogen sulfide and water from natural gas comprising passing an inlet natural gas stream containing hydrogen sulfide, CO_2, and water into contact with molecular sieves which act both as (1) an adsorbant for hydrogen sulfide and water and (2) catalyst in the reaction for conversion of hydrogen sulfide and carbon dioxide to carbonyl sulfide with,

(a) treating of about 92 to about 95 volume percent of said natural gas stream by passing a first portion of said natural gas stream into contact with molecular sieves in a first phase contactors to produce, by adsorption and conversion of H_2S to COS, a first treated gas stream of sufficiently low H_2S and H_2O content to be salable;

(b) passing a portion of this treated gas stream back through said molecular sieve beds of said first phase as regeneration gas to desorb the adsorbed H_2S thereby producing a first low pressure regeneration gas stream;

(c) passing a second portion of said about 92 to about 95 volume percent of the natural gas inlet stream into contact with molecular sieves in a second phase of contactors to produce a second treated gas stream by adsorption and the reaction to form COS;

(d) passing said second treated gas stream through the molecular sieves of said second phase as regeneration gas thereby producing a second low pressure regeneration gas;

(e) uniting the low pressure regeneration gas streams of (b) and (d) and condensing heavy liquid hydrocarbons from the united low pressure regeneration gas streams; p1 (f) combining the united low pressure regeneration gas stream with the remaining about 5 to about 8 percent by volume of the inlet gas and subjecting this combined stream to scrubbing;

(g) contacting this combined stream with molecular sieves in the second phase of contactors thereby producing by adsorption and reaction of H_2S to COS, a second treated gas stream of sufficiently low H_2S and H_2O content to be mixed with the first treated gas stream of (a) and retain salable quality; and

(h) combining the effulent streams of (a) and (g)

4,522,794

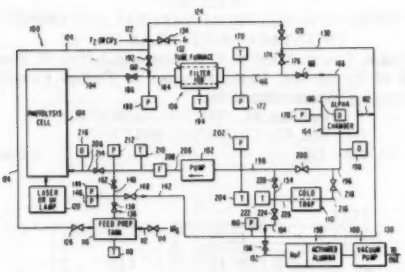
FLUORINATION PROCESS USING CATALYST

Robert C. Hochel, and Kathy A. Saturday, both of Aiken, S.C., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 25, 1983, Ser. No. 526,249

Int. Cl.³ C01G *56/00*

U.S. Cl. 423—251 **9 Claims**



1. In the process of converting an actinide compound selected from the group consisting of a plutonium oxide, a plutonium tetrafluoride, and a mixture of said plutonium oxides and tetrafluorides, to the corresponsing volatile actinide hexafluoride by fluorination with a stoichiometric excess of fluorine gas, the improvement which comprises conducting said fluorination in the presence of a fluoride catalyst powder selected from the group consisting of CoF_3, AgF_2 and NiF_2, whereby said fluorination is significantly enhanced.

4,522,795

PHOSPHONITRILIC CHLORIDE POLYMERS

Hsueh M. Li, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 447,720, Dec. 7, 1982, Pat. No. 4,447,408, which is a continuation-in-part of Ser. No. 314,522, Oct. 26, 1981, Pat. No. 4,374,815. This application Apr. 22, 1983, Ser. No. 487,804

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.³ C01B *25/10*

U.S. Cl. 423—300 **25 Claims**

1. In a process for producing linear phosphonitrilic chloride polymers from phosphonitrilic chloride oligomers of lower molecular weight the improvement pursuant to which a mixture of phosphonitrilic chloride oligomers enriched in linear phosphonitrilic chloride oligomer and comprising predominantly oligomer represented by the formula:

$$[Cl—(PCl_2{=}N)_n—PCl_3]^+PCl_6^-$$

wherein n is a numeral which averages at least 3 and at least a stoichiometric amount of ammonium chloride or ammonia, or both, is heated in a first stage to a reaction temperature in the range of from about 120° to about 200° C. for from about 0.5 to about 15 hours while concurrently removing hydrogen chloride to produce an intermediate reaction product, and then in a second stage the reaction product is heated to a higher temperature in the range of from about 150° to about 280° C. for from about 1 to about 36 hours to increase the molecular weight of the polymer.

4,522,796

PHOSPHONITRILIC CHLORIDE POLYMERS

Hsueh M. Li, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 447,720, Dec. 7, 1982, Pat. No. 4,447,408, which is a continuation-in-part of Ser. No. 314,522, Oct. 26, 1981, Pat. No. 4,374,815. This application Apr. 22, 1983, Ser. No. 487,805

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.³ C01B *25/10*

U.S. Cl. 423—300 **25 Claims**

1. In a process for producing linear phosphonitrilic chloride polymers from phosphonitrilic chloride oligomers of lower molecular weight the improvement pursuant to which a mixture of phosphonitrilic chloride oligomers enriched in linear phosphonitrilic chloride oligomer and comprising mainly oligomers represented by the formula:

$$[Cl—(PCl_2{=}N)_n—PCl_3]^+PCl_6^-$$

wherein n is a numeral which averages at least 3 and at least a stoichiometric amount of ammonium chloride or ammonia, or both, is heated to a polymerization reaction temperature in the range of from about 120° to about 280° C. from about 0.5 to about 36 hours while concurrently removing hydrogen chloride from the polymerization reaction mixture so that a substantially linear phosphonitrilic chloride polymer is formed.

4,522,797

HALOPHOSPHAZENE POLYMERS

F. Alexander Pettigrew; Hsueh M. Li, and Genevieve S. Lum, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 8, 1983, Ser. No. 530,761

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.³ C01B *25/10*

U.S. Cl. 423—300 **21 Claims**

1. A process for the preparation of halophosphazene polymer which comprises heating a substance of the formula

$$X—(PX_2{=}N)_n—POX_2$$

wherein X is a halogen atom and n is an integer below about 15, with a phosphorus pentahalide so that halophosphazene having a $—PX_3^+$ end group is formed, and then heating at least a portion of the resultant reaction product with at least a stoichiometric amount of a nitrogen source so that hydrogen halide is evolved and halophosphazene polymer of higher molecular weight is formed.

4,522,798

HALOPHOSPHAZENE POLYMERS

Genevieve S. Lum; Hsueh M. Li, and F. Alexander Pettigrew, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 8, 1983, Ser. No. 530,776
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[3] C01B *25/10*
U.S. Cl. 423—300 18 Claims

1. In a process wherein halophosphazene polymer is produced by heating halophosphazene composed at least predominantly of linear halophosphazene of lower molecular weight with at least a stoichiometric amount of a nitrogen source so that hydrogen halide is evolved and halophosphazene polymer of higher molecular weight is formed, the improvement in which the halophosphazene of lower molecular weight is substantially freed of $—POX_2$ end groups (X being a halogen atom) before forming the halophosphazene polymer of higher molecular weight.

4,522,799

PROCESS FOR PREPARING OLIVINE SAND CORES AND MOLDS

Charles E. Seeney, Brazil; John F. Kraemer, and Janis Ingebrigtsen, both of Terre Haute, all of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 342,312, Jan. 25, 1982, Pat. No. 4,383,861.
This application Nov. 12, 1982, Ser. No. 440,919
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.
Int. Cl.[3] C01B *25/36*
U.S. Cl. 423—306 5 Claims

1. A method for preparing zinc olivine phosphate by heating zinc dihydrogen phosphate and olivine in a ratio of 0.5–10:1 to a temperature of about 1000° C. or more until the reaction mixture fuses, then cooling to ambient temperatures.

2. The product obtained by the method of claim 1.

3. A process for the preparation of KOP by the steps of mixing potassium dihydrogen phosphate with olivine in a ratio of 0.5–10:1 respectively and heating to over 805° C. until the mixture fuses, then cooling to ambient temperatures.

5. The product obtained by the process of claim 3.

4,522,800

PROCESS FOR THE PRODUCTION OF A CRYSTALLINE ALUMINOSILICATE ZEOLITE

Herbert Baltes, Frankfurt am Main; Heinz Litterer, Wiesbaden; Ernst I. Leupold, Neu-Anspach, and Friedrich Wunder, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,860
Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217322
Int. Cl.[3] C01B *33/20*
U.S. Cl. 423—329 3 Claims

1. A method for making a crystalline aluminosilicate zeolite which

(a) contains silicon, aluminum, sodium, and potassium in the following ratio, expressed as a molar ratio of oxides,

$$SiO_2:(0.02–0.30)Al_2O_3:(0.05–0.30)[Na_2O+K_2O],$$

(b) exhibits the following characteristic signals in its X-ray diffraction diagram as synthesized

TABLE 1

Interplanar spacings d[Å]	Relative intensity I/I_0
11.5 ± 0.3	strong to very strong
9.2 ± 0.2	weak
7.6 ± 0.2	weak to medium
6.6 ± 0.1	medium to strong

TABLE 1-continued

Interplanar spacings d[Å]	Relative intensity I/I_0
6.3 ± 0.1	weak
5.7 ± 0.1	weak
5.35 ± 0.1	weak
4.56 ± 0.1	weak to medium
4.32 ± 0.1	strong
4.16 ± 0.1	weak
3.81 ± 0.1	medium to strong
3.75 ± 0.1	strong to very strong
3.59 ± 0.1	strong to very strong
3.30 ± 0.1	medium
3.15 ± 0.1	medium
2.86 ± 0.1	strong to very strong
2.80 ± 0.1	weak to medium
2.67 ± 0.1	weak to medium
2.49 ± 0.1	weak to medium

where I_O denotes the intensity of the strongest signal, which method comprises heating, in a sealed vessel, at a temperature from 80° C. to 200° C., for a time between 18 hours and 1000 hours, a reaction mixture of water and compounds of silicon, aluminum, sodium, potassium, and of an organic template agent having the following initial composition expressed as a molar ratio,

$$SiO_2:(0.02–0.30)Al_2O_3:(0.02–0.40)Na_2O:(0.02–0.30)-K_2O:$$

(0.04–1.00) of the organic template agent (10–90)H_2O, and then calcining the crystalline zeolite so made to destroy said organic template agent said organic template agent being provided as

(i) an ammonium compound of the formula RX wherein R is an ammonium cation of the formula $(HOCH_2CH_2)_4N^+$, $(HOCH_2CH_2)_3R^1N^+$, or $(HOCH_2CH_2)_2R^1R^2N^+$ and R^1 and R^2, which are the same or different, are hydrogen or alkyl having up to 5 carbon atoms, and X is hydroxy, chloride, bromide, iodide, sulfate, phosphate, sulfonate, carboxylate, carbonate, or sulfite, or as

(ii) a mixture of one molar part of at least one of diethanolamine and triethanolamine with from one to 10 molar parts of methanol, ethanol, propanol, butanol, ethylene glycol, 1,2-propylene glycol, dimethyl sulfate, diethyl sulfate, methyl iodide, ethyl iodide, propyl iodide, methyl p-toluenesulfonate, ethyl p-toluenesulfonate, or propyl p-toluenesulfonate.

4,522,801

PROCESS FOR PRODUCING CARBON FIBER OR GRAPHITE FIBER

Osamu Yoshinari; Yoshifumi Kawakatsu, and Hideaki Fukuizumi, all of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,735
Claims priority, application Japan, Oct. 8, 1982, 57-176335
Int. Cl.[3] D01F *9/22*
U.S. Cl. 423—447.4 28 Claims

1. A process for producing acrylic carbon fiber with minimized fluffing and coalescence, comprising:

treating a preoxidized fiber strand derived from an acrylonitrile fiber strand with an aqueous solution containing a compound selected from the group consisting of polyethylene oxide having a molecular weight greater than 100,000, methyl cellulose, ethyl cellulose, and hydroxyethyl cellulose;

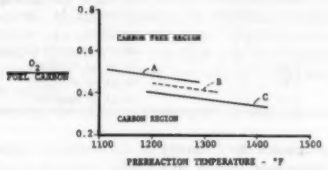
drying the treated fiber strand at a temperature lower than 250° C.; and

continuously feeding the dried treated fiber strand into a carbonizing oven, wherein said acrylonitrile fiber comprises a polyacrylonitrile or a copolymer of a vinyl compound and more than 90 wt.% of acrylontrile.

4,522,802
STEAM REFORMING UTILIZING IRON OXIDE CATALYST

Herbert J. Setzer, Ellington; John A. S. Bett, Hamden, and Roger R. Lesieur, Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 372,252, Apr. 26, 1982, Pat. No. 4,451,578. This application Nov. 25, 1983, Ser. No. 555,269
Int. Cl.³ C01B *1/02*
U.S. Cl. 423—652 5 Claims

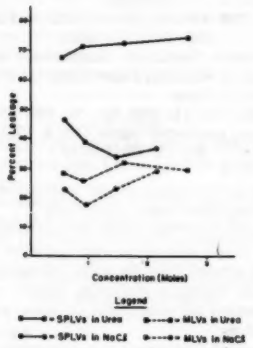


1. In an autothermal steam reforming process including passing a mixture of hydrocarbon fuel, steam and preheated air over a catalyst bed to form hydrogen, wherein the improvement comprises using as the catalyst material iron oxide deposited on a lanthanum stabilized alumina substrate, the iron oxied comprising about 20% to about 30% by weight, to substantially eliminate carbon plugging in such reforming systems and allow operation of the reforming process at reduced oxygen to carbon ratios with heavier distillate hydrocarbons such as No. 2 fuel oil.

4,522,803
STABLE PLURILAMELLAR VESICLES, THEIR PREPARATION AND USE

Robert P. Lenk, Lambertville; Michael W. Fountain, Plainsboro; Andrew S. Janoff, Lawrenceville; Marc J. Ostro, North Brunswick, and Micrea C. Popescu, Plainsboro, all of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 463,900, Feb. 4, 1983, abandoned, Ser. No. 447,247, Dec. 6, 1982, abandoned, Ser. No. 411,466, Aug. 25, 1982, abandoned, Ser. No. 362,995, Mar. 29, 1982, abandoned, Ser. No. 362,994, Mar. 29, 1982, abandoned. This application Mar. 24, 1983, Ser. No. 476,496
Int. Cl.³ A61J *3/07*; A61K *9/52, 43/00*; B01J *13/02*
U.S. Cl. 424—1.1 44 Claims



1. A method for preparing stable plurilamellar vesicles, comprising:

(a) forming a dispersion of at least one amphipathic lipid in an organic solvent;

(b) combining the dispersion with a sufficient amount of an aqueous phase to form a biphasic mixture in which the aqueous phase can be completely emulsified; and

(c) concurrently emulsifying the aqueous phase while evaporating the organic solvent of the biphasic mixtures,

wherein the stable plurilamellar vesicles produced are substantially free of MLVs, SUVs, and REVs.

11. Stable plurilamellar vesicles comprising lipid vesicles ranging from about 100 nm to about 10,000 nm in size, characterized by a few to over 100 lipid bilayers enclosing aqueous compartments containing at least one entrapped solute in which the lipid bilayers have an ordered molecular architecture creating a supramolecular structure which differs from that of other multilamellar vesicles so that when compared to other multilamellar vesicles composed of the identical lipid and aqueous ingredients, stable plurilamellar vesicles have the following properties:

(a) a higher percent entrapment of solute;

(b) a lower buoyant density;

(c) a volume about one-third larger;

(d) greater stability to auto-oxidation during storage in buffer;

(e) greater stability in body fluids;

(f) a larger percent leakage of entrapped solute when exposed to urea, guanidine, or ammonium acetate;

(g) a smaller percent leakage of entrapped solute when exposed to hydrochloric acid or serum; and

(h) distribution of entrapped contents throughout the cytosol of cells when administered to the cells in culture.

23. Stable plurilamellar vesicles according to claim 11, wherein a compound selected from the group consisting of: dyes, fluorescent compounds, radioactive compounds, and radio-opaque compounds is entrapped within the vesicle.

4,522,804
CONSTANT RELEASE RATE SOLID ORAL DOSAGE FORMULATIONS OF PROPRANOLOL

James M. Dunn, Littleton, Colo., assignor to Verex Laboratories, Inc., Englewood, Colo.

Division of Ser. No. 455,192, Jan. 3, 1983,. This application Feb. 16, 1984, Ser. No. 580,823
Int. Cl.³ A61K *9/22, 9/26*
U.S. Cl. 424—19 5 Claims

1. A constant order release rate solid oral dosage formulation of propranolol or a pharmaceutically acceptable salt thereof, said formulation comprising: a therapeutically effective amount of propranolol or pharmaceutically acceptable salt thereof, from about 0.5 to 6.0 weight percent of microcrystalline cellulose alone or with one or more acid-retardant hydrophobic cellulose derivatives; from about 2.5 to 35 weight percent of a hydrogenated vegetable oil; from about 1 to 20 weight percent of pharmaceutically acceptable acrylic acid polymer; from about 0.5 to 4.0 weight percent of fumed silicon dioxide and from about 0.4 to 3.0 weight percent of a tableting lubricant.

4,522,805
TOOTH AND GUM DENTIFRICE

Norman Gordon, 114 Sussex Rd., New Rochelle, N.Y. 10804

Filed Jun. 8, 1983, Ser. No. 502,142
Int. Cl.³ A61K *7/16, 7/20, 7/18*
U.S. Cl. 424—52 4 Claims

1. A tooth and gum dentifrice composition in the form of a stable paste, for controlling and minimizing incipient periodontal disease and for aiding in the reduction of dental plaque comprising from about 15% to 25% by weight of sodium bicarbonate, from about 7.5% to 15% by weight of calcium carbonate, from about 6% to 11% by weight of carbonide peroxide in anhydrous glycerin, from about 0.5% to 1.5% by weight of acidulated sodium flouride of a low ph, and from about 47.5% to 72% by weight of a paste including a synthetic detergent containing water, a humectant, sorbitol, a binder, and a flavoring agent.

4,522,806

ORAL COMPOSITIONS FOR HEXETIDINE AND ZINC SALTS FOR THE SYNERGISTIC INHIBITION OF DENTAL PLAQUE

Hans R. Muhlemann, and Ulrich P. Saxer, both of Zurich, Switzerland, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 309,050, Oct. 6, 1981, abandoned. This application Dec. 19, 1983, Ser. No. 563,011

Claims priority, application United Kingdom, Oct. 10, 1980, 8032743

Int. Cl.³ A61K 7/18, 7/22

U.S. Cl. 424—52 8 Claims

1. An oral composition for inhibiting the formation of dental plaque comprising about 0.08 to about 3000 ppm w/w of hexetidine and zinc in cationic and cationizable form in a total quantity of about 4.0 to about 1265 ppm w/w.

4,522,807

SUBSTANTIVE TOPICAL COMPOSITIONS

Carl Kaplan, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 342,304, Jan. 25, 1982, abandoned. This application May 19, 1983, Ser. No. 496,032

Int. Cl.³ A61K 7/42, 7/44

U.S. Cl. 424—59 14 Claims

1. A dermatologically compatible, highly substantive sunscreening oil-in-water emulsion composition comprising 0.1 to 5% octadecene-1/maleic anhydride copolymer having a molecular weight of 4,000 to 100,000, an effective sunscreening amount of a sunscreening agent, an oil, from 40 to 95% water and having a pH of 6 to 10.

4,522,808

ANTI-SUNBURN COMPOSITIONS CONTAINING 2-PHENYL-INDOLE DERIVATIVES

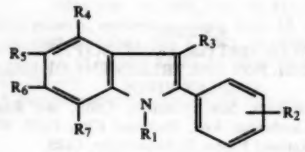
Bernard Jacquet, Antony; Gérard Lang, Epinay-sur-Seine, and Alain Malaval, Aulnay-sous-Bois, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 178,582, Aug. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 716,650, Aug. 23, 1976, abandoned. This application Sep. 30, 1982, Ser. No. 428,755

Int. Cl.³ A61K 7/06, 7/021, 7/42, 9/12

U.S. Cl. 424—59 4 Claims

1. A cosmetic composition comprising a cosmetic vehicle and at least about 0.05 percent by weight based on the total weight of said composition of a compound of the formula



wherein

R_1 is selected from the group consisting of hydrogen, alkyl containing 1 to about 12 carbon atoms and optionally branched carboxyalkyl radical containing 1 to 4 carbon atoms,

R_2 is selected from the group consisting of hydrogen, alkoxy containing 1 to 4 carbon atoms, at least one alkyl and carboxyalkyl radical containing 1 to 4 carbon atoms and halogen,

R_3 is $-S-\left[\begin{matrix}CH-\\ |\\ CH_3\end{matrix}\right]_m-(CH_2)_n-COOH$

wherein

m is 0 or 1 and n is 0, 1 or 2, and

each of R_4, R_5, R_6 and R_7 is independently selected from the group consisting of hydrogen, alkyl containing 1–4 carbon atoms, carboxyalkyl containing 1–4 carbon atoms and alkoxy containing 1–4 carbon atoms.

4,522,809

PROCESS FOR OBTAINING LIPID ENVELOPE VIRUS SUB-UNITS, NOTABLY ANTIGENS FOR USE AS VACCINES, THE PRODUCTS OBTAINED AND THEIR APPLICATIONS

Philippe Adamowicz, Garches, and Ludwig Muller, Plessis Robinson, both of France, assignors to Institut Pasteur, Paris, France

Filed Aug. 1, 1984, Ser. No. 636,791

Claims priority, application France, Feb. 11, 1980, 80 02978

Int. Cl.³ A61K 39/145

U.S. Cl. 424—89 9 Claims

1. A process for the production of immunogenic heavy subunits of influenza virus, comprising the following steps, carried out at a neutral or basic pH:

(1) dissolving an amount of chloroform in an aqueous influenza virus suspension to obtain a concentration of chloroform equivalent to or approximating its solubility limit in said suspension, thereafter,

(2) adding, with stirring, to the preparation so obtained a nonionic detergent while maintaining a single phase system, said detergent being added at the minimal concentration necessary to effect disruption of the virus into heavy immunogenic subunits, and stirring this mixture for a sufficient length of time to obtain said disruption, said heavy subunits comprising neuraminidase and hemagglutinin antigens in their original arrangement attached to fragments of the lipid envelopes of said virus, and

(3) separating the heavy subunits so obtained from lighter components by applying gradient fractionation methods to the reaction mixture, said lighter components comprising said chloroform, said detergent and other products originating from the disruption of said virus, and said heavy subunits being in the dense fraction of the gradient, wherein an inactivation agent is added to the reaction medium at any time during the process.

4,522,810

FELINE CALICIVIRUS VACCINE

Niels C. Pedersen, Winters, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 9, 1982, Ser. No. 448,098

Int. Cl.³ A61K 39/12; C12N 7/00

U.S. Cl. 424—89 10 Claims

1. A vaccine for protection against viremia caused by feline calicivirus, said vaccine comprising the strain FCV-2280, in an effective amount to produce an immune response, and a physiologically acceptable carrier.

4,522,811

SERIAL INJECTION OF MURAMYLDIPEPTIDES AND LIPOSOMES ENHANCES THE ANTI-INFECTIVE ACTIVITY OF MURAMYLDIPEPTIDES

Deborah A. Eppstein; Elizabeth B. Fraser-Smith, both of Los Altos, and Thomas R. Matthews, Los Gatos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 8, 1982, Ser. No. 396,213
Int. Cl.³ A61K *37/02*
U.S. Cl. 514—2 9 Claims

1. A method for enhancing the anti-infective activity of a muramyldipeptide (MDP) compound which method comprises serial intravenous injection to an animal in need thereof an anti-infective enhancing amount of unencapsulated MDP compound and liposomes within three hours of each other wherein said MDP compound.

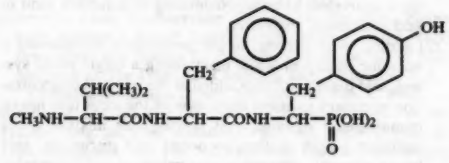
4,522,812

NOVEL PHYSIOLOGICALLY ACTIVE SUBSTANCE K-4, A PROCESS FOR PREPARATION THEREOF AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Toshiro Koguchi, Yokohama; Hiroshi Kase, Koganei; Isao Kawamoto, Hiratsuka, all of Japan; Masaji Kasai, Rockville, Md.; Kunikatsu Shirahata, Komae, Japan; Ryo Okachi, Shizuoka, Japan, and Kiyoshi Nakayama, Sagamihara, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1982, Ser. No. 407,082
Claims priority, application Japan, Aug. 18, 1981, 56-128740
Int. Cl.³ C07C *103/52;* A61K *37/02*
U.S. Cl. 514—7 2 Claims

1. The compound, K-4, represented by the formula



wherein the configuration of the phenylalanine and N-methylvaline parts is L-form and the 1-amino-2-(4-hydroxyphenyl) ethylphosphonic acid part has negative specific rotation.

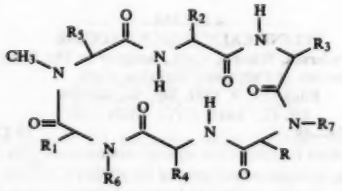
4,522,813

CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

Ruth F. Nutt, Green Lane, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 27, 1983, Ser. No. 545,982
Int. Cl.³ C07C *103/52;* A61K *37/02*
U.S. Cl. 514/11 11 Claims

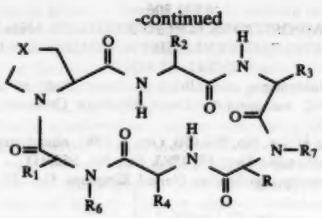
1. A compound having the formula:



I

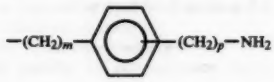
and

-continued



II

wherein
R is



such that the broken line indicates that the ring may be either cyclohexyl or phenyl;
m is 0 or 1; and p is 0 when the ring is cyclohexyl and 1 when the ring is phenyl;
X is $(CH_2)_n$ wherein n is 0, 1 or 2, sulfur;
R_1 and R_2 are independently lower alkyl, benzyl, substituted benzyl wherein the substitutent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with hydroxy, 3-indolylmethyl, carboxy, amino, guanidino, or a 5- or 6-membered heterocyclic ring;
R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen;
R_4 is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl, 3-indolylmethyl or substituted hydroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro, or a 5- or 6-membered heterocyclic ring;
R_5 is loweralkyl, benzyl, or substituted benzyl wherein the substituent is loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro; and
R_6 and R_7 are independently hydrogen or methyl.

4,522,814

COMPOSITION OF MATTER FROM *CRYPTOSIPHONIA WOODII* USEFUL FOR THE TREATMENT OF HERPES SIMPLEX VIRUS

Arthur M. Nonomura, San Francisco, Calif., and Raphael Pappo, 913 Cambridge Ave., Redwood City, Calif. 94061, assignors to Raphael Pappo, Redwood City, Calif.

Filed Nov. 5, 1982, Ser. No. 439,369
Int. Cl.³ A61K *31/715;* C08B *37/00*
U.S. Cl. 514—54 14 Claims

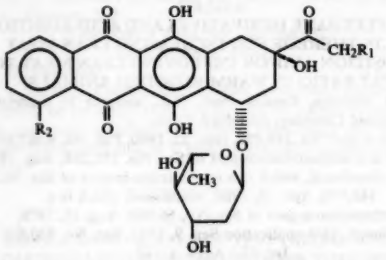
6. A method of treating a herpes simplex virus infection in a subject comprising administering to said subject an effective antiviral amount of an unbuffered aqueous extract of homogenized *Cryptosiphonia woodii* wherein the extract contains a polysaccharide comprising glucose and galactose units and more than about 5.0% sulfur by weight based on the weight of the extract.

4,522,815
ANTHRACYCLINE GLYCOSIDES

Alberto Bargiotti; Sergio Penco, and Anna M. Casazza, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Italy

Filed May 31, 1983, Ser. No. 499,308
Claims priority, application United Kingdom, May 24, 1982, 8215083
Int. Cl.³ A61K *31/71*; C07H *15/24*
U.S. Cl. 514—34 14 Claims

1. An anthracycline glycosidic compound of the formula I:



(I)

wherein R_1 is hydrogen or hydroxy and R_2 is hydrogen.

10. A method of inhibiting the growth of P388 leukemia or transplanted gross leukemia comprising administering to a mammal afflicted therewith, a therapeutically effective amount of an anthracycline glycoside according to claim 1.

4,522,816
ANALGESIC TREATMENT AND COMPOSITIONS

Francoise Delevalleé , Vincennes, and Roger Deraedt, Pavillons-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 19, 1983, Ser. No. 543,270
Claims priority, application France, Oct. 26, 1982, 82 17892
Int. Cl.³ A61K *27/00, 31/46, 31/68, 31/445, 31/485*
U.S. Cl. 514—52 14 Claims

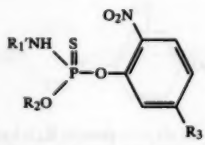
1. An analgesic composition comprising a central analgesic selected from the group consisting of morphine, pethidine, dextromoramide and pentazocine and an amount of a vitamin B_{12} component selected from the group consisting of vitamin B_{12}, hydroxocobalamine, nitrocobalamine, methylcobalamine, dibenzozide and coenzyme of vitamin B_{12} sufficient to potentialize the central analgesic.

4,522,817
PHOSPHORAMIDOTHIONATES AND FUNGICIDAL USE

Hideo Kohsaka, Takarazuka; Mitsuru Sasaki, Toyonaka, and Yukio Ishiguri, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

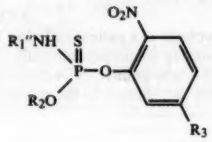
Filed Mar. 14, 1983, Ser. No. 475,166
Claims priority, application Japan, Mar. 15, 1982, 57-41210; Mar. 16, 1982, 57-42280; Oct. 5, 1982, 57-175567
Int. Cl.³ A01N *57/30, 57/32*; C07F *9/24*
U.S. Cl. 514—95 10 Claims

1. A phosphoramidothionate of the formula:



wherein R_1' is a lower alkoxy(lower)alkyl group, a di(lower-)alkoxy(lower)alkyl group, a halogen atom-substituted lower alkyl group, a cyano group-substituted lower alkyl group, a lower alkylthio(lower)alkyl group, a lower dioxothiacycloalkyl group, a lower thiacycloalky group, a lower oxacycloalkyl group, a furanyl(lower)alkyl group of a thiophenyl(lower)alkyl group, R_2 is a lower alkyl group and R_3 is a lower alkyl group or a lower alkoxy group.

3. A fungicidal composition which comprises as an active ingredient a fungicidally effective amount of a phosphoramidothionate of the formula:



wherein R_1'' is a lower alkenyl group, a lower alkynyl group, a lower cycloalkyl group, a lower cycloalkyl(lower)alkyl group, a halogen atom-substituted lower alkyl group, a lower alkoxy(lower)alkyl group, a di(lower)alkoxy(lower)alkyl group, a cyano group-substituted lower alkyl group, a lower alkythio(lower)alkyl group, a lower dioxothiacycloalkyl group, a lower thiacycloalkyl group, a lower oxacycloalkyl group, a furanyl(lower)alkyl group or a thiophenyl(lower)alkyl group, R_2 is a lower alkyl group and R_3 is a lower alkyl group or a lower alkoxy group, and an inert carrier or diluent.

4,522,818
DIURETIC/ANTIHYPERTENSIVE COMPOSITIONS

Yegnaswami Raghunathan, Fairport, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 14, 1982, Ser. No. 434,302
Int. Cl.³ A61K *31/635*
U.S. Cl. 514—155 7 Claims

7. A method of treating hypertension, comprising orally administering to a person an effective dosage of a mixture of metolazone, triamterene and excipients, said mixture containing from about 0.025 to 2.5 percent by weight of metolazone, from about 2.5 to 25 percent by weight of triamterene, and from about 72.5 to 97.0 percent by weight of excipients consisting essentially of dibasic calcium phosphate, starch, microcrystalline cellulose and a lubricant.

4,522,819
1-ETHYL-6-FLUORO-1,4-DIHYDRO-4-OXO-7-(1-PIPERAZINYL)-3-QUINOLINE CARBOXYLIC ACID AND METAL SALTS THEREOF USEFUL IN BURN THERAPY

Charles L. Fox, Jr., Sherman, Conn., and Shanta M. Modak, River Edge, N.J., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Continuation of Ser. No. 193,307, Oct. 2, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,452
Int. Cl.³ C07D *401/10*; A61K *31/495, 31/555, 31/47*
U.S. Cl. 514—187 23 Claims

1. A metal salt of 1-ethyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinoline carboxylic acid wherein the metal moiety is selected from the group consisting of silver, zinc, cerium, and cobalt.

6. A method of treating burns in animal or man which comprises topically applying an effective antibacterial amount of the metal salt of claim 1 to the affected surface.

4,522,820

TRANS-DIHYDROLISURIDE ANTIPSYCHOTIC

Rainer Dorow; Reinhard Horowski; Wolfgang Kehr, and Helmut Wachtel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,427

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129714

Int. Cl.³ A61K *31/48, 31/475*

U.S. Cl. 424—288 9 Claims

1. A method of treating psychosis in a patient suffering from psychosis comprising administering an antipsychotically effective amount of N-(D-6-methyl-8-isoergolinyl)-N'N-diethylurea or a physiologically acceptable salt thereof to the patient.

4,522,821

ANTI-EMETIC ESTERS OF CYPROHEPTADINE-3-CARBOXYLIC ACID AND STRUCTURALLY RELATED COMPOUNDS

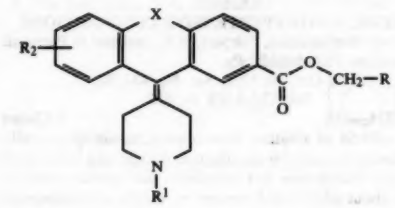
David C. Remy, North Wales, and Bradley V. Clineschmidt, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 368,257, Apr. 14, 1982, Pat. No. 4,412,999. This application Aug. 8, 1983, Ser. No. 520,939

Int. Cl.³ A61K *31/445;* C07D *401/04, 401/12*

U.S. Cl. 514—320 8 Claims

7. A method of treating emesis, gastro-oesophageal reflux and/or dyspepsia comprising the prophylactic or therapeutic administration to a patient in need of such treatment of an effective dopamine antagonist amount of a compound of structural formula:

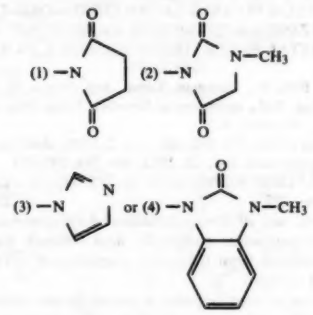


I

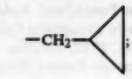
or a pharmaceutically acceptable salt thereof, wherein X is

(1) $-CH_2-O-$,	(2) $-O-CH_2-$,
(3) $-CH_2-S-$,	(4) $-S-CH_2-$,
(5) $-S-$, or	(6) $-O-$;

R is



R^1 is (1) C_{1-3}alkyl, or (2)



and

R^2 is (1) hydrogen, (2) C_{1-3}alkyl, or (3) fluoro.

4,522,822

PHENYLETHANE DERIVATIVES AND ACID ADDITION SALTS THEREOF FOR INCREASING LEAN MEAT DEPOSITION AND/OR IMPROVING LEAN MEAT TO FAT RATIO IN WARM BLOODED ANIMALS

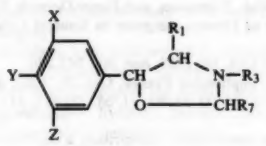
Jane A. Kiernan, Kendall Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 219,055, Dec. 22, 1980, Pat. No. 4,407,819, which is a continuation-in-part of Ser. No. 181,255, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 143,070, Apr. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,909, Aug. 16, 1979, abandoned. This application Sep. 9, 1983, Ser. No. 530,848

Int. Cl.³ A61K *31/42*

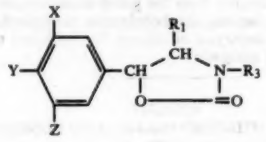
U.S. Cl. 514—376 18 Claims

1. A method for increasing lean meat, improving the lean meat to fat ratio, reduction of body fat and improving the efficiency of feed utilization, or increasing the growth rate in warm-blooded animals comprising: orally or parenterally administering to said animals, a pharmacologically effective amount of a compound having the general formula selected from the group consisting of;



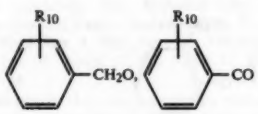
(Ia)

and



(Ib)

wherein X is hydrogen, halogen, or —CN; Y is hydrogen, NR_8R_9 or $NHCOR_5$; Z is halogen, OH, CF_3, CN, $COOR_1$, $CONH_2$, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro or C_1–C_4 dialkylaminomethyl; R_1 is hydrogen or C_1–C_4 alkyl; R_3 is C_1–C_5 alkyl, C_3–C_4 alkenyl, C_3–C_5 cycloalkyl, 2-hydroxyethyl, α,α-dimethylphenethyl, benzyl, 3-phenylpropyl or 3-(4-carbomethoxyphenyl)propyl; R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy,



or $N(R_1)_2$; R_7 is hydrogen, C_1–C_4 alkyl or phenyl; R_8 is hydrogen, C_1–C_4 alkyl or C_3–C_4 alkenyl; R_9 is hydrogen, C_1–C_6 alkyl, C_4–C_6 cycloalkyl, C_3–C_4 alkenyl or benzyl; R_{10} is hydrogen, chloro, dichloro, methyl, dimethyl, methoxy, dimethoxy or nitro; and when R_8 and R_9 are taken together with the

nitrogen to which they are attached, they may represent pyrrolidino; with the provisos that when Z is OH, X and Y are hydrogen; when X is —CN, Z is —CN; and when R_8 is C_1–C_4 alkyl or C_3–C_4 alkenyl, R_9 is C_1–C_4 alkyl or C_3–C_4 alkenyl; or racemic mixtures of the above-identified compounds, the optically active isomers, or nontoxic, pharmacologically acceptable acid addition salts thereof.

4,522,823

OREXIGENIC USE OF α-FLUOROMETHYL-HISTIDINE

Harley M. Hanson, Norristown, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 5, 1984, Ser. No. 568,451
Int. Cl.³ A61K *31/415*
U.S. Cl. 514—400 **3 Claims**

1. A method of stimulating appetite comprising administering orally or by sterile injection to man or animal in need of such treatment an effective appetite stimulating amount of α-fluoromethylhistidine or a pharmaceutically acceptable salt thereof.

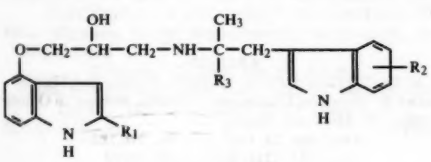
4,522,824

INDOLE DERIVATIVES OF TRYPTAMINE AND CARDIOVASCULAR COMPOSITIONS THEREOF

Jean Wagnon, Montpellier; Patrick Gautier, Courmonterral, and Jean-Pierre Gagnol, St. Martin de Londres, all of France, assignors to Sanofi, Paris, France

Filed Mar. 21, 1983, Ser. No. 477,494
Claims priority, application France, Mar. 23, 1982, 82 04921
Int. Cl.³ A61K *31/40*; **C07D** *403/12*
U.S. Cl. 514—414 **7 Claims**

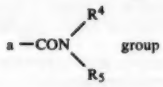
1. Compounds derived from tryptamine of formula:



(I)

in which:

R_1 represents a CH_2OH group, a —C≡N group,



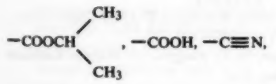
group

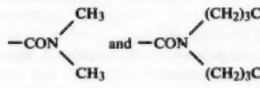
or a $—COOR_6$ group in which R_4, R_5 and R_6 denote a lower alkyl group or hydrogen;

R_2 represents hydrogen or a C≡N group;

R_3 denotes hydrogen, a CH_3 group or a CH_2OH group, and the addition salts of the products of formula I with pharmaceutically acceptable, mineral or organic acids.

2. Compounds of claim 1, where R_1 is hydrogen, R_3 is CH_3 and R_1 is selected from the group consisting of $—CONH_2$, $—CH_2OH$,





4,522,825

ACARICIDE COMPOSITIONS EMPLOYING SYNERGISTIC MIXTURES OF 1-DECYLOXY-4-(7-OXA-4-OCTINYL)-OXY-BENZENE AND PROPARGITE

Giovanni Regiroli, Novate Milanese; Vincenzo Caprioli, San Martino, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 31, 1983, Ser. No. 480,760
Claims priority, application Italy, Apr. 1, 1982, 20526 A/82
Int. Cl.³ A01N *37/52, 41/02, 55/04, 57/00*
U.S. Cl. 514—517 **6 Claims**

1. An acaricide mixture with synergistic effect consisting of a mixture of the compound 1-decyloxy-4-(7-oxa-4-octinyl)-oxy-benzene with 2-(4-tert.butyl-phenoxy)-cyclohexyl-(2-propinyl-sulphite, in a ratio of 2.5:1 and 1:1.

4,522,826

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING DIPHENHYDRAMINE AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Feb. 8, 1984, Ser. No. 578,288
Int. Cl.³ A61K *31/19, 31/40, 31/131*
U.S. Cl. 514—569 **44 Claims**

1. A method for eliciting an enhanced analgesic and anti-inflammatory response in a mammalian organism in need of such treatment, comprising administering to such organism

(i) an analgesically and anti-inflammatorily effective amount of ibuprofen, naproxen, benoxaprofen, flurbiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen or bucloxic acid or a pharmaceutically acceptable salt thereof, and

(ii) an analgesically and anti-inflammatorily potentiating amount of diphenhydramine.

4,522,827

METHOD OF TREATING ACUTE PANCREATITIS WITH ISOMETHEPTENE

Maria G. Marlettini; Michelangelo DeNovellis; Ernesto Labriola; Teresa Salomone, and Paola Tomassetti, all of Bologna, Italy, assignors to Knoll AG, Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,797
Int. Cl.³ A61K *31/13*
U.S. Cl. 514—671 **3 Claims**

1. A method for treating acute pancreatitis which comprises administering by infusion to a person afflicted with that condition an effective amount of Isometheptene contained in an injectable solution to relieve the attendant pancreatitis symptoms followed by orally administered dosages of a composition containing an effective amount of Isometheptene and a pharmaceutically acceptable excipient.

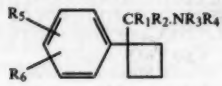
4,522,828

THERAPEUTIC AGENTS

James E. Jeffery; Antonin Kozlik, and Eric C. Wilmshurst, all of Nottingham, England, assignors to The Boots Company plc, Nottingham, England

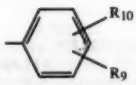
Filed Apr. 5, 1982, Ser. No. 365,285
Claims priority, application United Kingdom, Apr. 6, 1981, 8110709
Int. Cl.³ A01N *33/02*
U.S. Cl. 514—646 **29 Claims**

1. A method of treating depression which comprises administering to a depressed patient a therapeutically active amount of a compound of formula I



I

in which R_1 is selected from the group consisting of straight or branched chain alkyl groups containing 1 to 6 carbon atoms, cycloalkyl groups containing 3 to 7 carbon atoms, cycloalkylalkyl groups in which the cycloalkyl group contains 3 to 6 carbon atoms and the alkyl group contains 1 to 3 carbon atoms, alkenyl groups containing 2 to 6 carbon atoms, alkynyl groups containing 2 to 6 carbon atoms and groups of formula II



II

in which R_9 and R_{10}, which are the same or different are selected from the group consisting of H, halo and alkoxy groups containing 1 to 3 carbon atoms;

in which R_2 is selected from the group consisting of H and alkyl groups containing 1 to 3 carbon atoms;

in which R_3 ad R_4, which are the same or different are selected from the group consisting of H, straight or branched chain alkyl groups containing 1 to 4 carbon atoms, alkenyl groups having 3 to 6 carbon atoms, alkynyl groups having 3 to 6 carbons atoms, cycloalkyl groups in which the ring contains 3 to 7 carbon atoms, and a group of formula CHO or R_3 and R_4 together with the nitrogen atom form an optionally substituted heterocyclic ring having 5 or 6 atoms in the ring optionally containing further hetero atoms in addition to the nitrogen atom;

in which R_5 and R_6, which are the same or different are selected from the group consisting of H, halo, trifluoromethyl, alkyl groups containing 1 to 3 carbon atoms, alkoxy groups containing 1 to 3 carbon atoms, alkylthio groups containing 1 to 3 carbon atoms and phenyl or R_5 and R_6, together with the carbon atoms to which they are attached, form a second benzene ring optionally substituted by at least one halo, alkyl or alkoxy group containing 1 to 4 carbon atoms or the substituents of the second benzene ring together with the two carbon atoms to which they are attached form a further benzene ring;

or a pharmaceutically acceptable salt thereof.

4,522,829

1-(P-2-ISOPROPOXYETHOXYMETHYL-PHENOXY)-3-ISOPROPYLAMINO-PROPAN-2-OL FOR DECREASING THE INTRA-OCULAR PRESSURE AND AN OPHTHALMIC PREPARATION THEREOF

Jürgen Harting, and Andreas Fuchs, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,914

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125636

Int. Cl.³ A61K *31/135*

U.S. Cl. 514—652 **10 Claims**

1. An ophthalmic composition comprising intraocular pressure lowering amount of 1-(p-2-isopropoxyethoxymethyl-phenoxy)-3-isopropylamino-propan-2-ol or a physiologically acceptable salt thereof and an ophthalmically acceptable carrier, in the form of an eye drop solution, an eye ointment, or an ocular film insert.

4,522,830

PHARMACEUTICAL METHODS USING PARABENZOQUINONE TO TREAT MUSCLE SPASMS

Channing B. Ewing, P.O. Box 47, East Lake Weir, Fla. 32632

Division of Ser. No. 466,141, Feb. 14, 1983, Pat. No. 4,443,479, which is a division of Ser. No. 370,066, Apr. 20, 1982, Pat. No. 4,382,095. This application Feb. 24, 1984, Ser. No. 582,393

Int. Cl.³ A61K *31/12*

U.S. Cl. 514—690 **2 Claims**

1. A method for treating smooth muscle spasms, said method comprising administering to a person suffering therefrom an effective amount of parabenzoquinone and continuing said administration, as required, until the smooth muscle spasms have been alleviated.

4,522,831

METHOD OF TOTALLY SUPPRESSING OVARIAN FOLLICULAR DEVELOPMENT

Robert T. Chatterton, Jr., River Forest, Ill., assignor to Northwestern University, Evanston, Ill.

Filed May 2, 1983, Ser. No. 490,797

Int. Cl.³ A01N *31/00*

U.S. Cl. 514—169 **6 Claims**

1. The method of totally suppressing ovarian follicular development and related hormonal secretions, comprising administering to a woman having menstrual cycles during a period of menstruation a first dose of from 2 to 10 milligrams (mg) per kilogram (kg) of body weight of 2α,17α-diethynyl-A-nor-5α-androstane-2β,17β-diol dipropionate, said administration being by intramuscular injection and being given on the first day of menstrual bleeding or within two days thereafter while menstruation is continuing, the injected amount of anordrin being effective to produce said total suppression for over 56 days without administration of additional anordrin by any route.

4,522,832

LACTASE-CONTAINING BAKING FORMULATIONS

Bradley W. Morrison, Chateauguay, Canada, assignor to Ogilvie Mills Ltd., Montreal, Canada

Filed Apr. 21, 1982, Ser. No. 370,182

Int. Cl.³ A21D *8/04*; G12P *19/14*

U.S. Cl. 426—20 **15 Claims**

1. In a formulation for producing baked yeast goods comprising flour, water and an added amount of discrete yeast fermentable sugar sufficient to produce a desired degree of leavening in said baked yeast goods, a fat-source material and a lactose-containing dairy product, the improvement comprising:

an added lactase enzyme in an enzymatic amount selected so as to be sufficient to produce, in situ, during the preparation of said yeast goods, a quantity of yeast-fermentable glucose and galactose by enzymatic hydrolysis of the lactose contained in said dairy product;

whereby the amounts of said glucose and galactose so produced are sufficient to permit a corresponding reduction in said added amount of discrete yeast fermentable sugar to thereby provide a sufficient total amount of yeast-fermentable sugars in said formulation, to produce said desired degree of leavening.

4,522,833

ROASTED COATED NUT PRODUCT AND PROCESS THEREFOR

Shri C. Sharma, Mendham, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 13, 1984, Ser. No. 570,476

Int. Cl.³ A23L *1/36*

U.S. Cl. 426—93 **18 Claims**

1. A process for producing a flavor enhanced edible nut which comprises:

(a) partially roasting raw nuts at a temperature of about 137°

C. to about 188° C. for about 2.5 minutes to about 6 minutes until the onset of flavor development;

(b) then coating the partially roasted nuts at a temperature of about 98° C. to about 150° C. with a coating slurry comprising about 2½% to about 10% by weight of a sugar syrup, about 6% to about 25% by weight of sugar and about 2½% to about 4½% by weight of an oil, said coating slurry having a water content of about 15% to about 30% by weight based on the slurry, during which coating time the nuts and slurry are at substantially the same temperature;

(c) subjecting the coated nuts to a final roasting cycle at a temperature of about 137° C. to about 188° C. for about 4 minutes to about 11 minutes until full flavor development occurs;

(d) cooling the coated nuts to about room temperature; and

(e) recovering the nut product.

4,522,834

METHOD OF AND APPARATUS FOR PRODUCING ELECTRICALLY PROCESSED FOODSTUFFS

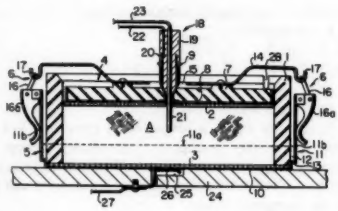
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,508

Claims priority, application Japan, May 25, 1983, 58-90804

Int. Cl.³ A23L *3/32*; G01N *33/02*; H05B *6/46*

U.S. Cl. 426—231 **6 Claims**



1. A method of producing a processed foodstuff by passing a current to a raw food material comprising the steps of:

holding the raw food material placed in an insulating container open on upper and lower sides between an upper electrode member and a lower electrode member serving concurrently as a receiver of juices given off by the raw food material located on opposite sides of the raw food material through respective salt water containing contact members, said upper electrode member and lower electrode member being resiliently connected together in an insulated condition; and

passing a current between the upper electrode member and lower electrode member to heat the raw food material to sterilize it while allowing juices given off by the raw food material to be received by the lower electrode member and collect in a juice trap provided between the lower electrode member and the insulating container.

4,522,835

PROCESS AND COMPOSITION FOR PRODUCING AND MAINTAINING GOOD COLOR IN FRESH MEAT, FRESH POULTRY AND FRESH FISH

Richard E. Woodruff, Salinas, and John H. Silliker, Rolling Hills, both of Calif., assignors to TransFRESH Corporation, Salinas, Calif.

Continuation of Ser. No. 24,730, Mar. 28, 1979, abandoned, which is a continuation of Ser. No. 817,184, Jul. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 722,870, Sep. 13, 1976, abandoned. This application May 1, 1984, Ser. No. 605,784

Int. Cl.³ A23L *1/272*

U.S. Cl. 426—264 **26 Claims**

1. A process comprising subjecting fresh meat, fresh poultry or both to reduction for a time sufficient to change the red oxymyoglobin on and below the surface of said fresh meat, fresh poultry, or both, to visually-perceptible purple myoglobin, then subjecting said fresh meat, fresh poultry, or both, to a modified atmosphere including a concentration of carbon monoxide in the range of about 0.10% to about 3% by volume to convert said visually-perceptible purple myoglobin to visually-perceptible red carboxymyoglobin to a depth of not more than about 0.375 inch below the surface of said fresh meat, fresh poultry, or both.

12. A process comprising subjecting fresh fish to reduction for a time sufficient to change the visually-perceptible red oxymyoglobin and visually-perceptible red oxyhemoglobin on and below the surface of said fresh fish to visually-perceptible purple myoglobin and visually-perceptible purple hemoglobin, and then subjecting said fresh fish to a modified atmosphere including a concentration of carbon monoxide in the range of about 0.25% to about 1.5% by volume to convert said visually-perceptible purple myoglobin and visually-perceptible purple hemoglobin to visually-perceptible red carboxymyoglobin and visually-perceptible red carboxyhemoglobin to a depth of not more than about 0.375 inch below the surface of said fresh fish.

4,522,836

UPFLOW ION EXCHANGE TREATMENT OF NATURAL EDIBLE JUICES CONTAINING HIGH ACIDITY AND SUSPENDED SOLIDS

Fred J. Dechow, Midland, Mich.; Donald H. Mitchell; Richard M. Pearce, both of Winter Haven, Fla.; C. Byron Smith, Lake County, Fla., and Sand T. Brown, Lakeland, Fla., assignors to Mitco Water Laboratories, Inc., Winter Haven, Fla.

Filed May 19, 1983, Ser. No. 496,346

Int. Cl.³ A23L *2/36*

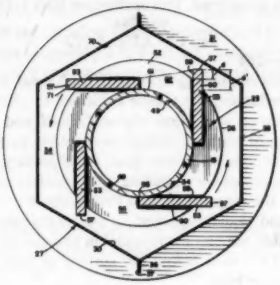
U.S. Cl. 426—271 **6 Claims**

1. In a method of treating with an ion exchange exchange resin an acidic edible natural juice containing a significant concentration of pulp solids suspended therein to reduce the acidity of such juice without significantly impairing its natural sweetness or reducing its pulp solids content, the improvement which comprises passing the juice to be treated through a laterally confined vertically unconfined supported particulate bed of a weakly basic anionic exchange resin of sufficient volume relative to the throughput of juice being treated to substantially reduce the acid content of such juice by an ion exchange reaction, said juice being passed upwardly through said resin bed at a generally uniform rate throughout the bed cross-sectional area which is sufficient to produce a vertical expansion of said bed of at least about 20–25% and sufficient to pass substantially said pulp solids but insufficient to cause substantial entrainment of resin particles with the treated juice effluent.

4,522,837
METHOD OF REMOVING BRAN FROM CEREAL GRAINS

Elmond F. Meinardus, Houston, Tex., assignor to Riviana Foods Inc., Houston, Tex.

Division of Ser. No. 227,744, Jan. 23, 1981, Pat. No. 4,426,921.
This application Jan. 18, 1983, Ser. No. 458,779
Int. Cl.³ B02B 3/00, 3/04
U.S. Cl. 426—482 7 Claims



1. A method of processing cereal grains for efficiently removing bran with a minimum of individual grain breakage comprising:

continuously supplying dehusked grains into an end of a longitudinally extending milling chamber having an outer apertured screen to retain said grains and having within said chamber a rotationally driven rotor assembly with longitudinally extending, inwardly closed pockets facing in the direction of rotation of said rotor, said pockets being between blades extending into said chamber,

forcing said grains longitudinally from said end of the chamber into said chamber with a portion thereof passing into the longitudinally extending pockets of the rotor assembly,

rotating said rotor assembly to convey grains carried within said pockets around the chamber during rotation of the rotor assembly with a portion of the grains in said pockets continually engaging grains surrounding the rotor assembly whereby all of the grains in passing through the chamber move in a dynamic pattern for bran removing contact with other grains, and

discharging the separated bran and processed grains from said chamber.

4,522,838
2-ACETYL-1-PYRROLINE AND ITS USE FOR FLAVORING FOODS

Ronald G. Buttery; Louisa C. Ling, both of El Cerrito, Calif., and Bienvenido O. Juliano, Los Banos Laguna, Philippines, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C. and International Rice Research Institute, Republic of the Philippines, Los Banos, Philippines

Filed Jun. 1, 1983, Ser. No. 500,049
Int. Cl.³ C07D 207/00; A23L 1/226
U.S. Cl. 426—537 8 Claims

1. The compound 2-acetyl-1-pyrroline or salt thereof which is at least 95% pure.

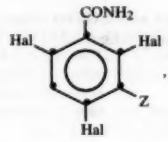
2. A process for preparing a food composition which comprises adding to a food the substantially pure compound 2-acetyl-1-pyrroline or salt thereof in an amount sufficient to impart Basmati rice flavor to the composition.

4,522,839
3-SUBSTITUTED 2,4,6-TRIHALOGENATED BENZAMIDES AS SWEETENING AGENTS

Heinz Gries, and Wolfgang Mützel, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 333,364, Dec. 22, 1981, Pat. No. 4,429,152.
This application Nov. 23, 1983, Ser. No. 554,654
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048918; Nov. 11, 1981, 3145395
Int. Cl.³ A23L 1/236
U.S. Cl. 426—548 21 Claims

1. A sweetener, comprising an effective sweetening amount of a compound having the formula I

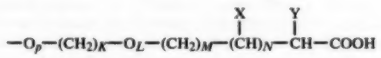


(I)

wherein

Hal is chlorine or bromine; and

Z is a carboxyl group or the group



wherein

P is 1 and L is 0 or 1, with the proviso that L is 0 when K is 0;

K is 0, 2, 3 or 4;

M is 0, 1, 2 or 3;

N is 0 or 1;

X is a hydrogen atom;

Y is a hydrogen atom or a lower alkyl group of 1–4 carbon atoms, or when either M or N is other than 0, a hydroxy group, a C_{1-6} alkoxy group or a C_{1-4} acyloxy group, or when N is 1 and M is other than 0, X and Y together represent an additional carbon-carbon bond; or

P and L are each 0;

K is 0, 2, 3 or 4;

M is 0, 1, 2 or 3;

N is 0 or 1;

X is a hydrogen atom;

Y is a hydrogen atom, a lower alkyl group of 1–4 carbon atoms, a hydroxy group, a C_{1-6} alkoxy group, a C_{1-4} acyloxy group or, when N is 1, X and Y together represents an additional carbon-carbon bond; or a salt thereof with an inorganic base;

and a non-toxic vehicle.

4,522,840
MANUFACTURE OF HIGHLIGHTED INTAGLIATED ARTICLES

Brian L. Corfield, Macclesfield, and Raymond C. Rowe, Congleton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 31, 1983, Ser. No. 499,400
Claims priority, application United Kingdom, Jun. 10, 1982, 8216815
Int. Cl.³ A61K 9/00
U.S. Cl. 427—3 10 Claims

1. In a process for the manufacture of coloured solid articles bearing at least one highlighted intagliation, which comprises: either (A) applying to coloured intagliated articles, which themselves may be uncoated or film coated, a film coating suspension comprising at least one optically anisotropic substance having a minimum refractive index not greater

than 2.00 and at least one film coating agent, the application being carried out in a conventional film coating apparatus in such a way that a rubbing action takes place between the articles being coated;

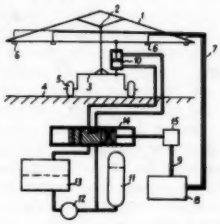
or (B) applying to coloured intagliated articles, which themselves may be uncoated or film coated, a suspension comprising at least one optically anisotropic substance having a minimum refractive index not greater than 2.00, but no film coating agent, and the application being carried out in a conventional film coating apparatus in such a way that a rubbing action takes place between the articles being coated; the improvement whereby better contrast is obtained between the highlighted intagliation and the rest of the surface of the article, said improvement comprising spraying the coloured solid articles bearing at least one highlighted intagliation obtained per (A) or (B) with a solvent in a conventional film coating apparatus in such a way that a rubbing action takes place between the said articles, whereby the contrast between the highlighted intagliation and the rest of the article surface is improved.

4,522,841

PROCESS FOR THE STABILIZATION WITH RESPECT TO A DESIRED PATH OF A MEMBER WHICH IS MOVABLY MOUNTED ACCORDING TO AT LEAST ONE COMPONENT OF MOVEMENT AND ITS APPLICATION TO THE STABILIZATION OF A SPRAY MANIFOLD

Etienne Gille; Jean Lucas; Didier Méchineau, and Marie-Odile Monod, all of Antony, France, assignors to Centre National Du Machinisme Agricole, Du Genie Rural, Des Eaux et des Forets (Cemagref), Antony, France

Filed Oct. 12, 1982, Ser. No. 433,695
Claims priority, application France, Oct. 9, 1981, 81 19099
Int. Cl.³ B05D *1/02*
U.S. Cl. 427—4 **7 Claims**



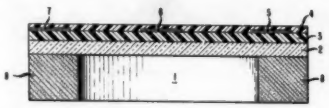
1. A process for the stabilization with respect to a desired path of a movably mounted member according to at least one component of a movement along the actual path, on at least one support point, along a path enabling the movable member to follow the desired path, in which there is exerted, between the movable member and said at least one support point and as a function of the position of the movable member with respect to the desired path, at least one force tending to return the movable member to the desired path, characterized in that the movable member has freedom of movement relative to said support point along at least one component of movement of the desired path, the forces whose magnitudes are independent of the position of the movable member with respect to said support point being applied as a function of the development of the position of the movable member with respect to the desired path and independently of the position of the movable member relative to said support point, the center of gravity of the movable member coinciding with said support point.

4,522,842

BORON NITRIDE X-RAY MASKS WITH CONTROLLED STRESS

Hyman J. Levinstein, Berkeley Heights; Shyam P. Murarka, New Providence, and David S. Williams, Morristown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 9, 1982, Ser. No. 416,290
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—8 **20 Claims**



1. A process for fabricating a mask structure for X-ray lithography, comprising the steps of

depositing on a support member a layer of an X-ray transparent material,

determining the stress of the layer,

annealing said layer subsequent to said deposition to obtain therein a stress in a desired range, said annealing step

controlling the stress subsequent to said deposition, whereby the film is made more tensile or more compressive depending on what is desired.

4,522,843

DEACIDIFICATION OF LIBRARY MATERIALS

Robert A. Kundrot, 3801 D Logans Ferry Rd., Pittsburgh, Pa. 15239

Filed Jan. 25, 1984, Ser. No. 573,739
Int. Cl.³ B05D *1/04, 1/06*
U.S. Cl. 427—27 **24 Claims**

1. A method of deacidifiying books, imaged paper and other imaged material having a cellulose base comprising treating said material with suitable alkaline particles of a basic metal selected from the group consisting of oxides, hydroxides and salts having a predominant particle size between 0.01 and 0.9 micron and a surface area between 50 and 200 m^2/g BET, dispersed in a gas with deposition enhancement by aerosol impingement, filtering through the paper or electrostatic attraction or dispersed in a liquid, in an amount and for a time sufficient to pass into the interstices of said imaged material and increase the PH of the material and provide an alkaline buffer without impairing the image thereon, said liquid consisting essentially of an inert halogenated hydrocarbon and a surfactant.

4,522,844

CORROSION RESISTANT COATING

Satish K. Khanna; Anilkumar P. Thakoor, both of Pasadena, and Roger M. Williams, Azusa, all of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 537,616
Int. Cl.³ C23C *15/00*
U.S. Cl. 427—38 **13 Claims**

1. A method of providing a substrate with a thin, corrosion-resistant coating comprising the steps of:

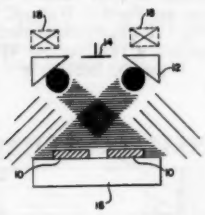
(a) selecting one or more transition metals;

(b) selecting one or more metalloids;

(c) thoroughly mixing said metals and metalloids to form a solid material in the shape of a target suitable for deposition sputtering;

(d) bombarding the target with ions of an inert gas in the presence of a magnetic field to provide a vapor of the target material and deposit the vaporous target material onto the substrate; and

(e) maintaining the pressure of the gas sufficiently low to cause the target material to deposit onto the substrate in a



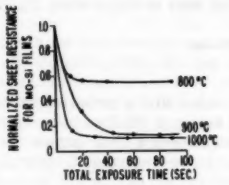
thin, uniformly thick, essentially pinhole-free amorphous metallic alloy film.

4,522,845

PROCESS FOR PRODUCING A LAYER OF A METAL SILICIDE BY APPLYING MULTICHROMATIC RADIATION

Ronald A. Powell, Redwood City, and Ronald T. Fulks, Mountain View, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 20, 1983, Ser. No. 505,678
Int. Cl.³ H01L *21/285, 21/324*
U.S. Cl. 427—53.1 **19 Claims**



1. A process for forming a layer of a metal silicide, comprising:

providing a source of multichromatic radiation;

forming a contact region between silicon and a silicide-forming metal; and

directing an intense beam of multichromatic radiation from said source to said silicon and said silicide-forming metal in an evacuated chamber at a power level and for a time sufficient to cause formation of a relatively large grain metal silicide and a reduction in sheet resistivity relative to the untreated contact region by a factor of about three or greater, said contact region being raised to a temperature greater than 800° C. for a time on the order of 60 seconds or less.

4,522,846

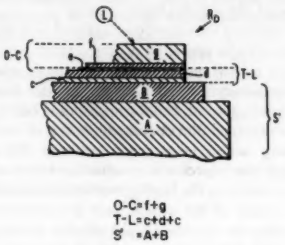
SPIRAL-COATED MEDIA FOR OPTICAL RECORDING

Thomas Mayer; Norman L. Boling, and James D. Rancourt, all of Santa Rosa, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 450,771, Dec. 17, 1982,. This application Mar. 12, 1984, Ser. No. 588,178
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—54.1 **22 Claims**

1. A method of providing a protective outer-seal coating over a disk having at least one recording area including an isolation surface coating wherein information is to be recorded with prescribed radiation, the method including the steps of:

preparing a formulation including at least one acrylate prepolymer, applying this formulation to the isolation coating on the recording area as to provide a mechanical/chemi-



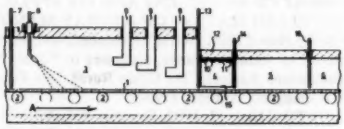
cal barrier, while also being relatively transparent to said radiation, and curing it there.

4,522,847

COATING VITREOUS SUBSTRATES

Julien Cornet, Temploux, and Robert Van Laethem, Loverval, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Apr. 29, 1983, Ser. No. 490,164
Claims priority, application United Kingdom, Apr. 30, 1982, 8212670
Int. Cl.³ B05D *3/06;* **B05C** *11/00*
U.S. Cl. 427—55 **25 Claims**



1. A process for forming a metal or metal compound coating on a face of a hot vitreous substrate in sheet or ribbon form by continously advancing the substrate in a given direction along a path through a coating station, discharging droplets of liquid coating precursor material in the given direction so that such material contacts the substrate at the coating station, continuously withdrawing vapours from the coating station in the given direction, and thereafter annealing the substrate in an annealing lehr, said process further comprising, before said step of annealing, passing the hot coated substrate (1) from the coating station (3) to the annealing lehr (6) via a re-heating station located ahead of the lehr (4), supplying, in the re-heating station, sufficient radiant heat energy to the hot coated substrate (1) to raise the temperature or the mean temperature of its coated surface, while the substrate is within said station, through a certain temperature range, at least the upper end of such range being not lower than a temperature 100° C. below the corresponding temperature of such surface immediately before its contact by said coating precursor material, and advancing the substrate through said re-heating station at a rate such that each increment of length of the substrate remains in said re-heating station for at least 5 seconds.

19. Apparatus for forming a metal or metal compound coating on a face of a hot vitreous substrate in sheet or ribbon form, such apparatus comprising a coating station, means for continuously advancing the substrate in a given direction along a path through the coating station, delivery means for discharging droplets of liquid coating precursor material in the given direction so as to contact a substrate at said coating station, and means for continuously withdrawing vapours from the coating station in the given direction, and an annealing lehr disposed for annealing the substrate as the substrate is being advanced along the path by said means for advancing and after the substrate has left said coating station, characterized in that at a position between said coating station (3) and said annealing

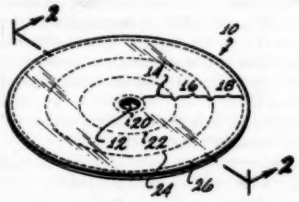
lehr (6) there is a re-heating compartment (4) which is separated from said coating station (3) by at least one boundary wall (13), which re-heating compartment is provided with radiant heating means (10) for heating the substrate (1) as it advances through said re-heating compartment (4) in order to raise the temperature or the mean temperature of the coated surface of the substrate, while the substrate is within said re-heating compartment, through a certain temperature range, at least the upper end of such range being not lower than a temperature 100° C. below the corresponding temperature of such surface immediately before its contact by the coating precursor material, and said means for advancing are operative for advancing the substrate through said re-heating compartment at a rate such that each increment of length of the substrate remains in said re-heating compartment for at least 5 seconds.

4,522,848

PROCESS OF PREPARING A RECORDING MEMBER HAVING A VARIABLE THICKNESS RECORDING LAYER

Pravin K. Patel, 7206 W. 78th St., Los Angeles, Calif. 90045

Filed Apr. 28, 1983, Ser. No. 489,370
Int. Cl.³ H01F *10/02*
U.S. Cl. 427—131 **6 Claims**



1. A process of preparing a magnetic recording disk which comprises:

electrolessly depositing upon a disk shaped substrate a metal containing non-recording support layer;

contacting said support layer with an anodic metal, said anodic metal comprising a metal which is more electropositive than cobalt, said support layer contacted at an area proximal to that area which will underlay the inner track zone of said recording disk, said contact with said anodic material producing an area of positive charge at said area of said support layer which will underlay said inner track zone;

electrolessly depositing upon said support layer a cobalt containing recording layer, the thickness of said cobalt containing recording layer at said area of positive charge being less than the thickness of said cobalt containing recording layer overlaying the remainder of said support layer.

4,522,849

METHOD FOR COATING QUARTZ WITH BORON NITRIDE

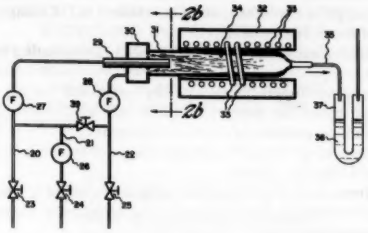
Robert S. Lewandowski, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 282,328, Jul. 10, 1981, abandoned. This application Oct. 18, 1983, Ser. No. 542,917
Int. Cl.³ B05D *7/22;* **C23C** *11/00*
U.S. Cl. 427—237 **6 Claims**

4. A method of applying a protective boron nitride film to the interior of a quartz tube, said method comprising the steps of:

heating said quartz tube to between about 900° C. and 1000° C., and purging the interior of said tube with inert gas;

mixing at a temperature of between about 200° C. and 400° C. ammonia gas and diborane gas and initiating flow of the mixed ammonia and diborane gases through the interior of said quartz tube when the temperature of said quartz tube has reached said temperature of between about 900° C. and 1000° C. and after discontinuing flow of said inert gas; and



allowing said mixed ammonia and diborane gases to flow through said quartz tube for a time sufficient to coat the interior of said quartz tube with a boron nitride film of desired thickness, said boron nitride being the product of a chemical reaction between said ammonia and diborane gases.

4,522,850

POLYMERIC SUBSTRATES FOR ELECTROLESS METAL DEPOSITION

Edward J. Leech, Oyster Bay, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation of Ser. No. 800,939, May 26, 1977, abandoned, which is a division of Ser. No. 598,770, Jul. 25, 1975, abandoned. This application Apr. 5, 1982, Ser. No. 365,476
Int. Cl.³ B05D *3/10;* **C23C** *3/02*
U.S. Cl. 427—304 **14 Claims**

1. A process for electrolessly metal plating an article comprising the steps:

(a) providing on the surface or portions of the surface of an article to be plated an polymeric layer which is a diphase polymerization product of a liquid mixture comprising (i) from about 45 to about 65 weight percent of a liquid precursor of a solid polymer having ethylenic unsaturation which upon polymerization yields an unsaturated substituted acrylonitrile butadiene rubber susceptible to oxidative degradation and (ii) from about 20 to about 40 weight percent of a highly functional aromatic liquid epoxy resin having substantially no ethylenic unsaturation which upon polymerization yields a thermosetting resin which is relatively impervious to oxidation, said diphase polymerization product having a dispersed phase rich in the polymer having ethylenic unsaturation and a continuous phase rich in the polymer having substantially no ethylenic unsaturation;

(b) oxidizing said polymeric layer to render said layer microporous; and

(c) contacting said microporous layer with an electroless metal deposition bath to form a layer of metal thereon.

4,522,851

PROCESS FOR COATING AQUEOUS DISPERSION OF EPOXY RESIN AND BLOCKED POLYISOCYANATE CONTAINING CHEMICALLY INCORPORATED ANIONIC HYDROPHILIC GROUPS

James W. Rosthauser, Imperial, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 429,708
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—386 **22 Claims**

1. An aqueously dispersed, heat-curable coating composition comprising

(a) a water-dispersible epoxy resin component containing external and/or chemically incorporated non-ionic emulsifiers and

(b) a water-dispersible, blocked polyisocyanate component containing chemically incorporated anionic hydrophilic groups in a weight ratio of component (a) to component (b) of about 1:10 to 10:1.

20. An aqueously dispersed, heat-curable coating composition comprising

(a) a water-dispersible epoxy resin component having an average molecular weight of about 500 to 20,000 and is the addition product of reactants comprising

(i) from about 50 to 90 parts by weight of the diglycidyl ether of a dihydric phenol,

(ii) from about 8 to 35 parts by weight of a dihydric phenol and

(iii) from about 2 to 15 parts of a chemically incorporated emulsifier; and

(b) a water-dispersible, blocked polyisocyanate component comprising the reaction product of

(i) a polyisocyanate containing 2 to 4 isocyanate groups,

(ii) a blocking agent for isocyanate groups in an amount sufficient to block about 30 to 95% of the isocyanate groups of component (i) and

(iii) a compound containing at least one potential anionic groups and at least one isocyanate-reactive group in an amount sufficient to react with the remaining isocyanate groups of component (i), the potential ionic groups being treated with a neutralizing agent in an amount sufficient to render component (b) water-dispersible.

21. A process for forming a coating which comprises

(a) coating a substrate with the coating composition of claim **1** or **20** and

(b) heating said coated substrate to a temperature between about 100° C. and 250° C. for a time sufficient to cure said coating composition.

4,522,852

BONDED ELASTOMERIC HOSE ASSEMBLY

John R. Dunn, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Division of Ser. No. 467,341, Feb. 17, 1983, Pat. No. 4,457,799, which is a continuation-in-part of Ser. No. 357,748, Mar. 12, 1982, abandoned. This application Apr. 10, 1984, Ser. No. 598,904

Int. Cl.³ F16L *11/00*

U.S. Cl. 428—36 **5 Claims**

1. A hose assembly comprising two layers, the inner layer being a fluoroelastomer compound and the outer layer being a butadiene-acrylonitrile polymer compound, said fluoroelastomer compound containing a fluoroelastomer based on vinylidene fluoride and hexafluoropropylene optionally also containing tetrafluoroethylene, perfluoromethylvinyl ether or ethylenically unsaturated olefins and containing one or more inorganic acid acceptors selected from magnesium oxide, cadmium oxide, calcium oxide, calcium hydroxide and zinc oxide, containing in either layer from about 1 to about 5 parts by weight per 100 parts by weight of fluoroelastomer or of butadiene-acrylonitrile polymer of a polysulphidic silane compound, the hose assembly having been vulcanized by heating at a temperature of from about 150° C. to about 180° C. for a time of from about 10 to about 60 minutes.

4,522,853

ELASTIC DIAPER-PANTS FASTENING

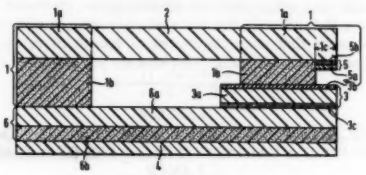
Bodo Szonn, Kisdorf; Karl Schäfer, and Alfred Malskeit, both of Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,428

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 8212480[U]

Int. Cl.³ G61F *13/16*

U.S. Cl. 428—40 **2 Claims**



1. Self-adhesive elastic diaper-pants fastening with an adhesive-free intermediate elastic piece and non-elastic adhesion ends, characterized by

(a) adhesion ends (**1**) with an intermediate elastic piece (**2**),

(b) a base (**1*a***), on which is mounted a pressure-sensitive adhesive (**1*b***), in the vicinity of each adhesion end (**1**),

(c) a strip that is free of pressure-sensitive adhesive and functions as a grip (**1*c***) and (**5**) at the edge of one of the two bases (**1*a***),

(d) a reinforcing strip (**6**) consisting of a base (**6*a***) and a pressure-sensitive adhesive (**6*b***),

(e) an adhesive-resistant layer (**3*b***) that is mounted either directly on the reinforcing strip (**6**) or by means of a transition strip (**3**) that consists of a base (**3*a***) and pressure-sensitive adhesive (**3*c***),

(f) the adhesive-resistant layer (**3*b***) extending 2–5 mm on each side of the pressure-sensitive adhesive (**1*b***) in the vicinity of the adhesion end (**1**) next to the grip (**5**), and

(g) a cover (**4**) that extends over the whole width of the fastening.

4,522,854

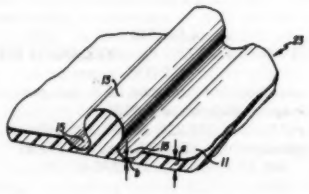
INTEGRAL FILM TEAR STRIP

Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 469,859

Int. Cl.³ B32B *3/30*

U.S. Cl. 428—43 **2 Claims**

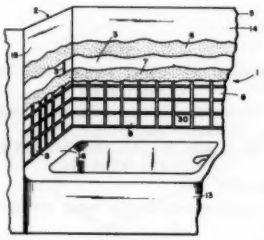


1. A plastic film comprising a layer of thermoplastic material and a thermoplastic bead extending along and integrally connected with said layer of thermoplastic material, said thermoplastic material having areas of reduced thickness extending along opposite sides of said bead to form lines of weakness for severing said plastic film.

4,522,855
TILING ARRANGEMENT

James R. Bethea, Denham Springs, La., assignor to Noble Manufacturing Company, Baton Rouge, La.

Division of Ser. No. 336,918, Jan. 4, 1982, abandoned, which is a division of Ser. No. 203,985, Nov. 4, 1980, Pat. No. 4,324,605. This application Jul. 11, 1983, Ser. No. 512,568
Int. Cl.³ B32B *3/14*
U.S. Cl. 428—49 7 Claims



1. A water resistant, tiled panel arrangement, comprising:
a rigid substrate constructed of a material susceptible to moisture damage, and including an exterior surface with a portion thereof to be tiled;
a sheet of imperforate, substantially waterproof material overlying and adhered to the exterior surface of said substrate, and having a solvent-based film adhesive on an exterior side of said sheet; said sheet being substantially coextensive with the portion of said exterior surface to be tiled;
a thin set layer of tile adhesive overlying and bonded to said film adhesive; and
ceramic tile embedded in said tile adhesive, and securely attached thereto in a cured adhesive state, whereby said sheet forms a substantially waterproof barrier between said tile and said substrate.

4,522,856
SYNTHETIC ARTICLES HAVING A CORK-LIKE APPEARANCE

Gary V. Paisley, Lilburn, and Alex Malaspina, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

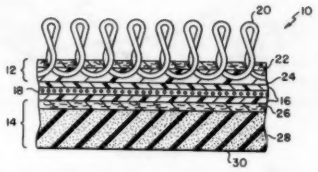
Division of Ser. No. 389,509, Jun. 16, 1982,. This application Jan. 18, 1983, Ser. No. 458,775
Int. Cl.³ B65D *53/00;* B32B *3/02, 5/14, 5/20*
U.S. Cl. 428—64 3 Claims

1. A molded closure possessing good flexibility and resiliency and having the appearance of natural cork which comprises
an expanded thermoplastic resinous material having the shape of the desired closure, and caramel as colorant therefor,
said expanded thermoplastic resinous closure containing a dense liquid-impervious outer skin and a porous inner core and being substantially free of large void spaces between said outer skin and inner core, whereby resistance to wrinkling during compression of the closure is effectively eliminated, and
said caramel colorant is present in an amount sufficient to give the closure the appearance of natural cork.

4,522,857
CARPET TILE WITH STABILIZING MATERIAL EMBEDDED IN ADHESIVE LAYER

Kenneth B. Higgins, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 24, 1984, Ser. No. 653,281
Int. Cl.³ D03D *27/00;* D04H *11/00;* D05C *17/00*
U.S. Cl. 428—95 8 Claims

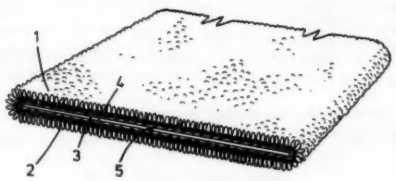


1. A carpet tile comprising: a primary carpet base having pile yarns projecting upwardly therefrom, a foam base layer below said primary carpet base and a thermoplastic material securing said primary carpet base to said foam layer base and having a layer of stabilizing material embedded therein, said foam layer base having a carrier material adjacent said thermoplastic material and a high density foam material on the side of said carrier material away from said carrier material.

4,522,858
BIG BLOTTER TOWEL

Carmen F. Desson, Box 822, Blind River, Ontario, P0R 1B0, Canada

Filed Dec. 14, 1981, Ser. No. 330,237
Int. Cl.³ A47K *10/02*
U.S. Cl. 428—96 5 Claims



1. A towel formed from a length of material connected along opposite transverse edges to define an endless loop having a pair of external drying surfaces each defined between a pair of opposite longitudinal edges, said surfaces overlying one another with said longitudinal edges in register and unconnected to allow relative movement between said surfaces, said surfaces facing in opposite directions, said material having a backing to present a pair of opposed inner surfaces separating said external surfaces on the interior of said loop the coefficient of friction between said inner surfaces being less than the coefficient of friction between the external surface and a body against which it is applied to facilitate relative movement between said inner surfaces said backing constituting means to permit relative movement between said external drying surfaces and thereby cause a rolling movement of said external drying surfaces of said towel along a body surface upon application of a force to the other drying surface in a direction parallel to the one drying surface.

4,522,859

METHOD OF MANUFACTURE OF HONEYCOMB NOISE ATTENUATION STRUCTURE FOR HIGH TEMPERATURE APPLICATIONS

Winford Blair, La Mesa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation-in-part of Ser. No. 089,177, Oct. 29, 1979,. This application Nov. 18, 1980, Ser. No. 208,015

Int. Cl.³ B23K *1/04*

U.S. Cl. 428—116 **12 Claims**

1. A method for manufacturing a honeycomb noise attenuation structure for a high temperature application, the structural components of said structure comprise a central honeycomb cellular core sandwiched between an imperforate and a perforate sheet with the outer surface of the perforated sheet having an overlay comprising a single layer of a porous metal, said method comprising the steps of:

(a) sizing the structural components;

(b) cleaning the structural components;

(c) diffusion bonding the single layer of porous metal to one surface of the perforated sheet;

(d) wetting only the central core cell walls with a binder;

(e) applying a selected amount of a powdered braze alloy evenly over the binder coated surfaces the core edges being left free from said powdered braze alloy;

(f) stacking the imperforate sheet, honeycomb cellular core and combined perforate sheet and single layer of porous metal in assembly order;

(g) placing the stacked structural components in a vacuum furnace;

(h) applying a positive pressure to the stacked structural components;

(i) evacuating the vacuum furnace;

(j) elevating the internal temperature of the evacuated furnace to a level causing the braze alloy to melt and flow; and

(k) returning the stacked components to ambient temperature.

4,522,860

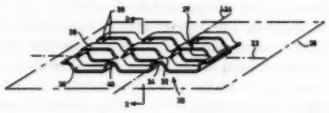
MATERIAL FOR REINFORCING CORE IN A STRUCTURE

John T. Scott, Hornings Mills, and Charles King, Mississauga, both of Canada, assignors to Metalcore Limited, Etobicoke, Canada

Filed Jan. 10, 1983, Ser. No. 456,914

Int. Cl.³ B32B *3/30*

U.S. Cl. 428—132 **15 Claims**



1. A sheet of material having a longitudinal axis and a transverse axis lying in a common plane, said material comprising alternating first and second strips extending along one of said axes and interconnected at spaced intervals along said one axis by lands lying in said common plane, each strip including portions between adjacent lands displaced from said common plane with all such portions of each of said first strips being formed to lie to one side of said common plane and all such portions of each of said second strips being formed to lie to the other side of said common plane.

4,522,861

PHOSPHORESCENT TREAD PLATE AND COMPOSITION

Charles L. Dunsworth, Midwest City, Okla., assignor to Metalines, Inc., Oklahoma City, Okla.

Filed Aug. 22, 1983, Ser. No. 524,978

Int. Cl.³ B32B *23/02*

U.S. Cl. 428—192 **4 Claims**

1. A phosphorescent, highly wear resistant composition comprising:

a mixture of approximtely one part zinc sulfide mixed with copper phosphorescent pigment, four parts bleached aluminum oxide, and a minimal amount of silicon carbide placed in deposition in combination with an epoxy resin hardened by a catalyst.

4,522,862

HIGH RESOLUTION RECORDING MEDIUM AND METHOD FOR PRODUCING SAME

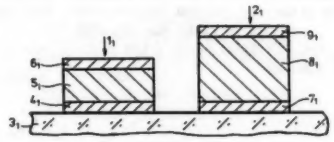
Erich Bayer, Trosberg; Anton Beckerbauer, Nussdorf; Georg Flatscher, Schneizlreuth, and Martin Ullrich, Ruhpolding, all of Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,557

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3147985

Int. Cl.³ B32B *3/00*; G03C *5/00*

U.S. Cl. 428—195 **18 Claims**



1. In a recording medium for a multicolor high resolution pattern, said medium having a substrate which supports at least two pattern-forming layer packs, each comprising a filter such that each layer pack defines a respective color, the improvement comprising:

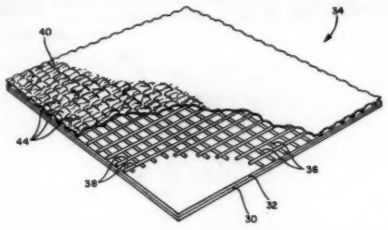
at least one of said layer packs comprising at least an interference filter having a pattern forming interference layer patterned in the pattern of the interference filter of the respective one of the layer packs, said pattern forming interference layer extending over only a part of the substrate, only in a region defined by the pattern of the interference filter;

at least the pattern forming layers of a first filter included in a first one of the layer packs being applied to the substrate locally separated from and prior in time to the pattern forming layers of a second filter included in a second one of the layer packs.

4,522,863
SOFT NONWOVEN LAMINATE BONDED BY ADHESIVE ON REINFORCING SCRIM

Daniel H. Keck, Woodstock; Ralph V. Braun, Roswell, and Mark B. Majors, Duluth, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 21, 1984, Ser. No. 105,273
Int. Cl.³ B32B *5/26, 7/14*
U.S. Cl. 428—196 **12 Claims**

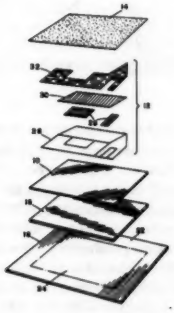


1. An improved nonwoven fabric laminate comprising, in combination:
   (a) a tissue layer having a basis weight in the range of from about 30 to 37 gsm including at least one tissue ply and said layer having a Frazier porosity in the range of from about 12 to about 30 CFM;
   (b) a primary strength bearing layer comprising a scrim including crossed filaments having applied thereto a heat reactable plastisol adhesive; and
   (c) a layer of microfibers having an average diameter of less than about 10 microns and a basis weight in the range generally from about 13.6 g/m^2 to 25.4 g/m^2;
   said combination including the scrim layer between the tissue and the microfiber layers and being bonded by means of said heat reactable plastisol adhesive applied to the scrim so that windows of substantially unbonded fibers are formed between the scrim filaments.

4,522,864
DECALS AND PROCESS FOR MAKING SAME

Dan C. Humason, 1973 La Corta St., Lemon Grove, Calif. 92045; Mayleta Buchwitz, 124 Southern Rd., El Cajon, Calif. 92020, and Theodore E. Higgins, El Cajon, Calif., assignors to Dan C. Humason, Lemon Grove and Mayleta Buchwitz, El Cajon, both of, Calif.

Continuation-in-part of Ser. No. 72,907, Sep. 6, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,217
Int. Cl.³ B32B *3/00;* **B44C** *1/16;* **C09J** *7/02*
U.S. Cl. 428—201 **6 Claims**



1. A multi-color decal comprising a porous paper backing, a water soluble slip layer on one surface of said paper, a mircroscopically thin, flexible, extensible, water resistant film covering said slip layer, a very thin translucent multi-color design offset printed on said water resistant film and a uniform layer of transparent or translucent pressure sensitive adhesive covering said design.

6. A process for producing a multi-color decal suitable for application to the skin comprising the steps of:
   (a) coating one side of a porous decal paper backing with a water-soluble slip layer;
   (b) coating the water-soluble slip layer with a very thin, flexible, extensible, water-resistant film;
   (c) offset printing a multi-color design on the water-resistant film; and
   (d) coating the design with a transparent, pressure sensitive adhesive;
   the slip layer being limited to the general area to be covered by the design and the water-resistant film covering substantially the entire area of one surface of the decal paper.

4,522,865
HOT PRESS-FORGING OF AN OPTICAL BODY WITH DYNAMIC CONSTRAINT BY CRYSTAL POWDER

Herbert Packer, Cleveland Heights, Ohio, assignor to Harshaw/Filtrol Partnership, Cleveland, Ohio

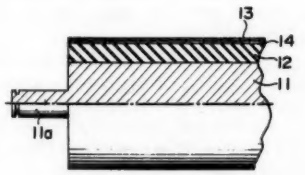
Division of Ser. No. 280,923, Jul. 6, 1981, Pat. No. 4,410,468. This application Aug. 18, 1983, Ser. No. 524,258
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—212 **2 Claims**

1. A polycrystalline press-forged composite, comprising
   (a) a central zone of an optically integral fully dense and homogeneous polycrystalline body being transparent in at least a portion of the wave length range from about 0.2 to about 30 microns, said body composed of a normally frangible material selected from the group consisting of an alkali metal halide, an alkaline earth metal halide, and an optical oxide, said body derived from an ingot or an extrudate and prepared by pressing the ingot or extrudate to obtain a deformation ratio greater than 1.0, and
   (b) an outer zone surrounding said central zone and consisting of a cluster of compacted hot-pressed crystals having a density in excess of 98% of the fully dense central zone, said crystals having a particle size in the range of 20 microns to 250 microns and having essentially the same thermal coefficient of expansion as said material in the central zone.

4,522,866
ELASTOMER MEMBER WITH NON-TACKY SURFACE TREATING LAYER AND METHOD OF MANUFACTURING SAME

Masaji Nishikawa, Hachioji; Takeji Takagi, Machida, and Masao Ueki, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 3, 1982, Ser. No. 354,359
Claims priority, application Japan, Apr. 23, 1981, 56-61584
Int. Cl.³ B32B *7/12, 27/40;* **G03G** *15/20;* **B21B** *31/08*
U.S. Cl. 428—216 **9 Claims**



1. An elastomer member with non-tacky surface treating

layer which may be used in a developing station, a transfer station or a conveying station of an electrophotographic copying system where deposition of toner is likely, consisting essentially of:

a base of a material which resists deformation having on its surface a base elastomer member which exhibits rubber-like elasticity at room temperature;

an elastic adhesive layer applied to the surface of the base elastomer member, the elastic adhesive layer having a thickness of from 3 to 15 microns and formed of a polyurethane rubber which bonds to the base elastomer member and exhibits a uniform rubber-like elasticity;

and a non-tacky surface treating layer comprising a dispersion of fine powder of fluorocarbon polymer in a binder resin which exhibits resistance to an organic solvent and applied to the surface of the adhesive layer.

4,522,867

BIAXIALLY ORIENTED POLYAMIDE FILM

H. Wayne Hill, Jr., and Jerry O. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1983, Ser. No. 525,752

Int. Cl.³ B32B *27/34, 3/20;* B28C *17/02*

U.S. Cl. 428—220 **19 Claims**

1. An amorphous biaxially-stretched film having a thickness in the range of about 0.02 mm to about 0.3 mm formed from an essentially amorphous polyamide which is the product of the condensation polymerization of 2,2-bis(4-aminocyclohexyl)-propane with a mixture of adipic acid and azelaic acid.

14. A process for preparing an amorphous film having a glass transition temperature of from about 174° C. to about 185° C., a haze value of below about 1.5 percent and a tensile strength of at least about 100 MPa, the process comprising

extruding an amorphous polyamide which is the product of the condensation polymerization of adipic acid, azelaic acid and 2,2-bis(4-aminocyclohexyl)propane into a sheet; and

biaxially orienting the extruded sheet at a temperature in the range of about 5° C. to about 20° C. above the sheet glass transition temperature of the polyamide and at a draw ratio of at least about 1.5 in each direction.

4,522,868

NEUTRON-SHIELDING FABRIC AND COMPOSITE FIBER AND METHOD OF MANUFACTURE THEREOF

Shigehiro Ohuchi, Otsu, and Masao Kataoka, Kusatsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,450

Claims priority, application Japan, Feb. 1, 1980, 55-9944; Aug. 14, 1981, 56-126694

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—224 **9 Claims**

1. A neutron shielding composite fiber comprising

(a) a core component of fiber-forming polymer (A) containing at least 5 weight percent of an isotope compound in particles with maximum diameters of 25 microns, capable of shielding against thermal neutrons, and

(b) a sheath component of a fiber-forming polymer (B) which is capable of bonding to said fiber-forming polymer (A).

4,522,869

POLYMERIC-COATED FABRIC LAYER, PRODUCT UTILIZING THE LAYER AND METHOD OF MAKING THE SAME

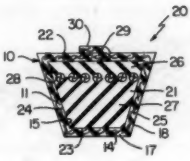
John F. Anderson, Jr., Springfield, Mo., and Delmar D. Long, Rock Hill, S.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 5, 1983, Ser. No. 482,363

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—245 **20 Claims**



1. In a polymeric belt construction comprising a polymeric belt body and a polymeric-coated fabric layer means secured to a surface of said polymeric belt body, said fabric layer means comprising a fabric layer having opposed sides, and a layer of polymeric material secured to one of said sides of said fabric layer and having an outer surface facing away from said fabric layer and being secured to said surface of said polymeric part of belt body by a heat curing operation on said belt body and said layer in the assembled relation thereof, the improvement wherein said polymeric layer comprises a foamed polymeric layer whereby said outer surface thereof readily conforms to said surface of said belt body to improve the bond therebetween during said heat curing operation thereof.

4,522,870

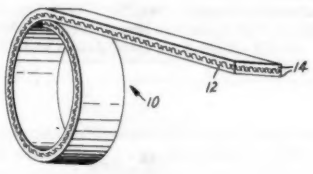
LINERLESS DOUBLE-COATED PRESSURE-SENSITIVE ADHESIVE TAPE

Donald L. Esmay, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 439,047, Nov. 3, 1982,. This application Apr. 4, 1983, Ser. No. 481,813

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—252 **12 Claims**



1. A linerless double-coated pressure-sensitive adhesive tape comprising a flexible support, at each face of which is a pressure-sensitive adhesive, which tape can be wound directly upon itself into a roll that can later be unwound without delamination or offsetting of adhesive, wherein the improvement comprises: each pressure-sensitive adhesive layer

(a) is a polymerized product of a predominantly alkyl acrylate composition, the alkyl groups of which have an average of 4–12 carbon atoms, each said composition being physically compatible with the other,

(b) is substantially solvent-free,

(c) contains a photoinitiator,

(d) is crosslinked, and

(e) affords at each face a 180° Peelback Value of at least 10 N/dm.

4,522,871

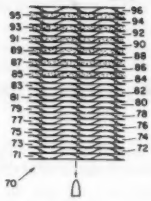
BALLISTIC MATERIAL FOR FLEXIBLE BODY ARMOR AND THE LIKE

Richard A. Armellino, Jr., 30 Barkers La., Huntington Station, N.Y. 11746, and Stephen E. Armellino, 27 Florence Point Dr., Fernandina Beach, Fla. 32034

Continuation of Ser. No. 260,329, May 4, 1981, abandoned. This application Apr. 6, 1983, Ser. No. 482,414

Int. Cl.³ B32B *5/00, 27/00;* **F41H** *5/08*

U.S. Cl. 428—252 **12 Claims**



1. A ballistic material suitable for use in flexible body armor, wall coverings and liners, curtains and draperies, said material comprising, from the outer protective side to the inner side of said material, at least three plies of ballistic cloth woven of aramid fibers and each individually impregnated with resorcinol formaldehyde latex means, at least nine plies of non-impregnated ballistic cloth woven of aramid fibers, and a ply of ballistic cloth woven of aramid fibers and impregnated with resorcinol formaldehyde latex means.

4,522,872

INDUSTRIAL FABRICS

Charles N. Berczi, Ormskirk, and Karen Hall, Bury, both of England, assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 367,413, Apr. 12, 1982,. This application Apr. 25, 1983, Ser. No. 488,346

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—257 **2 Claims**

1. An industrial fabric comprising warp and weft yarns of textured, continuous man-made filaments in a plain woven construction, said fabric having applied to it a flame-retardant finish provided on said fabric in an amount sufficient to provide flame-retardant properties to said finish, said finish comprising per 100 parts of dry solids the following components: forty to 55 parts of decabromodiphenyl oxide; 15 to 30 parts of zinc borate and from 15 to 30 parts of a binder selected from a group consisting of a self-cross-linkable acrylic/vinylidene chloride copolymer and an acrylic polymer cross-linked with melamine- or urea-formaldehyde and 0.25 to 20 parts of conductive carbon.

4,522,873

FIBROUS STRUCTURE HAVING ROUGHENED SURFACE

Takao Akagi; Shinji Yamaguchi, both of Kurashiki, and Akira Kubotsu, Soja, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

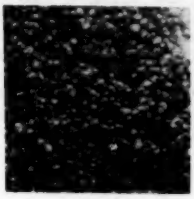
Filed Feb. 28, 1984, Ser. No. 584,331

Claims priority, application Japan, Feb. 28, 1983, 58-33301; Apr. 15, 1983, 58-67511; May 16, 1983, 58-86250

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—283 **2 Claims**

1. A fibrous structure having a roughened surface formed by projections containing fine particles and concave portions therebetween, wherein at least the surface layer of the fibers has irregularities therein whose structure is such that the distance between the adjacent projections is 0.01 to 0.7 micrometer and the total area of the concave portions is 0.1 to 0.8 square micrometer in 1 square micrometer of the irregularities.



4,522,874

ABSORBENT ARTICLE STRUCTURE AND ABSORBENT ARTICLE

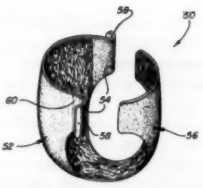
Philippe J. Pommez, Cassio da Costa Vidigal St. - 27 - 4th Floor, Sao Paulo, Brazil

Filed May 24, 1984, Ser. No. 613,492

Claims priority, application Brazil, Jun. 29, 1983, 8303466

Int. Cl.³ C08K *5/01*

U.S. Cl. 428—284 **6 Claims**



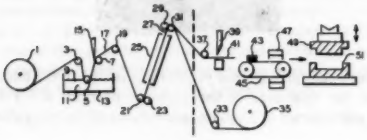
1. An absorbent article structure, comprising a liquid-permeable, internal layer (**10**), an absorbent, intermediate layer (**20**) and a liquid-impervious, outer layer (**30**), wherein the liquid-impervious layer (**30**) comprises an inherently-porous paper length (**32**) the outer surface of which is impregnated with a coat (**34**) of a selective adhesive which only adheres to itself, the adhesive coat (**34**) being comprised of an aqueous ammoniacal emulsion having about 60 percent solids and about 0.003 percent ammonia, the solids content in the emulsion comprising about 85 percent poly-cis-isoprene and about 15 percent of a mixture of polymers of vinyl acetate and n-butyl acrylate.

4,522,875

STAMPABLE SHEETS OF BONDED LAMINATE OF METAL SHEET AND FIBER MAT REINFORCED POLY(ARYLENE SULFIDE) AND METHOD OF PREPARATION USING RADIO FREQUENCY ENERGY

Robert D. Still, Jr., and Paul J. Boeke, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1983, Ser. No. 538,069
Int. Cl.³ B32B *15/00, 17/00, 27/06*
U.S. Cl. 428—285 41 Claims



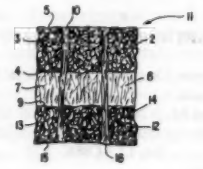
1. A porous composite of fibrous reinforcing mat surrounded by a discontinuous matrix forming a fused coating of the fibrous mat said matrix comprising poly(arylene sulfide) and a radio frequency energy sensitizer.

4,522,876

INTEGRAL TEXTILE COMPOSITE FABRIC

John J. Hiers, Elkin, N.C., assignor to Lydall, Inc., Manchester, Conn.

Filed Jul. 5, 1984, Ser. No. 627,688
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—285 26 Claims



1. An integral textile composite fabric of non-woven, needled textile fibers comprising:

(a) at least one organic textile fiber layer of laid and needled textile organic fibers, said layer having an inner and an outer surface;

(b) at least one glass fiber layer of laid and needled glass fibers, said layer having an inner and outer surface;

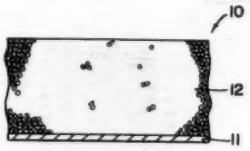
(c) a plurality of first needled stitches composed essentially of said organic fibers from said one organic fiber layer needled in and disposed substantially through said one glass fiber layer while the fibers of the said glass fiber layer are substantially undisturbed, whereby the said stitches bind the said layers together at their inner surfaces, the said layers are substantially non-detachable from each other and form an integral textile composite fabric having substantially uniform and high physical properties, and wherein there are at least 700 stitches per square inch of said binding stitches passing through said one glass fiber layer and wherein said one organic fiber layer is essentially free, at least on the outer surface thereof, of glass fibers displaced from said one glass fiber layer.

4,522,877

EXTRACTION OF POLYOXYALKYLENE SURFACTANTS FOR PHENOLIC FOAM STABILIZATION

Richard L. Frentzel, and Ernest K. Moss, both of Clearwater, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 542,803, Oct. 17, 1983, which is a division of Ser. No. 278,139, Jun. 29, 1981, Pat. No. 4,412,014, which is a continuation of Ser. No. 113,909, Jan. 21, 1980, abandoned.
This application Nov. 13, 1984, Ser. No. 670,785
Int. Cl.³ B32B *3/26*
U.S. Cl. 428—304.4 17 Claims



1. A laminated structural panel having at least one facing sheet and having a foam material adhering to the facing sheet wherein the foam material comprises the reaction product of:

A. phenol-aldehyde resin foam forming reactants,

B. a blowing agent, and

C. a surfactant which is the major component of a free radical polymerization, said major component being obtained by the steps of:

(1) reacting together a cyclic nitrogenous vinyl monomer and an esterified unsaturated dibasic acid by free radical polymerization in the presence of a polyoxyalkylene adduct having the formula

$$H\text{—polyoxyalkylene chain)}_t R,$$

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, said polyoxyalkylene adduct optionally being treated either before or after said polymerization with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50,

whereby a reaction product is obtained which can be used as a surfactant in the formation of phenolic foams, said step (1) reaction product comprising said major component and a minor component, the capacity of said major component for stabilizing phenolic foams being greater than that of said total step (1) reaction product; and

(2) separating from said step (1) reaction product by any conventional method said major and minor components thereof.

4,522,878

MATERIAL HAVING HIGH MECHANICAL STRENGTH AND DENSITY CLOSE TO UNITY, THE MANUFACTURE AND USES THEREOF

Madeleine Martin, Chatou; Jean Lesage, Maurepas Elancourt; Gérard Courbin, Grigny, and Alain Rivereau, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 28, 1984, Ser. No. 594,047
Claims priority, application France, Mar. 28, 1983, 83 05186
Int. Cl.³ B32B *3/26*
U.S. Cl. 428—313.7 14 Claims

1. A material with high mechanical strength and a density of about 0.70 to 1.15 g/cm^3, characterized in that it is obtained by a process which consists essentially of:

a step (a), in which a composition consisting essentially of melamine-formaldehyde resin, hollow microspheres having an apparent density of about 200 to 450 kg/m^3 and being other than clay or schist and light aggregates having

an apparent density of about 0.75 to 1.1 g/cm^3 and being selected from the group consisting of expanded clay and expanded schist is dispersed in water, the proportions of the constituents used range from 10 to 50% by weight, for the melamine-formaldehyde resin, from 10 to 50% by weight for the hollow microspheres and less than 60% by weight for the light aggregates,

a step (b), in which the dispersion thus formed is mixed, in the presence of a cross-linking catalyst for the melamine-formaldehyde resin, until a fluid paste is obtained;

a step (c), in which said fluid paste is allowed to harden at a temperature from 5° C. to 60° C. into the desired material.

4,522,879

TWO-PACKAGE URETHANE MAINTENANCE PRIMER

Achim R. Krueger, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 314,972, Oct. 26, 1981, abandoned. This application Jan. 26, 1984, Ser. No. 574,250

Int. Cl.^{3} B32B *5/16;* **C08K** *5/04;* **C09D** *3/72*

U.S. Cl. 428—323 **34 Claims**

1. A stable dispersion comprising at least one inert anhydrous organic solvent containing at least 55% by weight of solids of:

a binder formed from at least one polymeric polyol having 1–10% by weight of hydroxyl, a number average molecular weight of about 500–10,000 and a solubility of at least 30% by weight in the solvent; and

a pigment mixture containing (1) at least 20% by weight of a pigment in the form of platelets, (2) about 1–5% by weight of carbon black, and (3) about 1–5% by weight of barium lanolate,.

the pigment/binder weight ratio of said solids being in the range 60/100–600/100.

4,522,880

THICK POLYIMIDE-METAL LAMINATES WITH HIGH PEEL STRENGTH

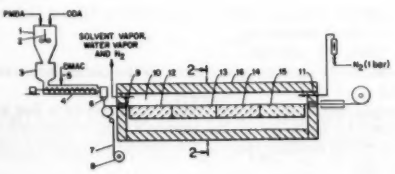
Werner Klostermeier, Klingenberg, Fed. Rep. of Germany; Jeffery D. Lasher, Tolland, Conn.; Gerhard Meyer, Obernburg, and Hans Zengel, Kleinwallstadt, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Enka, N.C.

Filed Sep. 21, 1983, Ser. No. 534,223

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301197

Int. Cl.^{3} B32B *15/08, 27/08;* **B28B** *3/20;* **B05D** *3/02*

U.S. Cl. 428—332 **18 Claims**



1. A planar, flexible laminate comprising a plenol-insoluble, intractable fully aromatic polyimide mono-layer and a supporting substrate; said substrate being either metallic foil, wire or cable, sheet metal or a formed polymeric fiber, film or sheet; wherein said polyimide layer is directly adhered to said substrate with a peel strength greater than 4.0 N/cm, said polyimide being insoluble in phenolic solvents, the polyimide layer having a tensile strength of at least about 100 N/mm^2 and a tensile elongation of 15 to 100 percent and a dissipation factor of from 1.5×10^{-3} to 5×10^{-3}, at 1 Khz.

2. The laminate of claim 1 wherein the thickness of said polyimide layer is from 10 μm to 1 mm.

4,522,881

COVER FILM FOR COLOR HARD COPY PRINTING PAPER

Naotake Kobayashi; Tetsuya Abe, and Yoshio Fujiwara, all of Utsunomiya, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00064, § 371 Date Oct. 31, 1983, § 102(e) Date Oct. 31, 1983, PCT Pub. No. WO83/03080, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 1, 1983, Ser. No. 552,037

Claims priority, application Japan, Mar. 2, 1982, 57-32612

Int. Cl.^{3} B41M *5/26*

U.S. Cl. 428—336 **6 Claims**

1. A cover film for a color hard copy printing paper comprising a heat-resistant base and a cover material layer including a colorless and transparent ultraviolet ray shielding layer which is formed on said heat-resistant base and has no adhesive property upon heating for said heat-resistant base and is capable of being melted and bonded to a surface of a printing paper by heating.

4,522,882

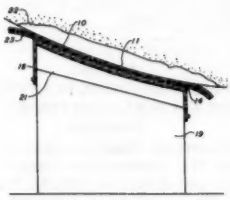
METHOD AND APPARATUS FOR COATING SUBMERGED PORTIONS OF FLOATING STRUCTURES

Herman S. Preiser, Severna Park; Arthur Ticker, Bowie, both of Md., and Kenneth J. Hatley, Madison, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 314,330, Oct. 23, 1981, Pat. No. 4,420,533. This application Sep. 19, 1983, Ser. No. 533,702

Int. Cl.^{3} C09J *7/02*

U.S. Cl. 428—351 **5 Claims**



1. A multilayered expanded compressible structure for use in coating the surface areas of a ship hull which are rendered inaccessible by docking blocks when the ship hull is directly supported thereon in dry dock, comprising:

a compressible first tape layer for attachment to a ship hull, adhesive means on one face of the tape structure for attaching the first tape layer to the ship hull;

a second tape layer for attachment to supporting surfaces of the docking blocks, compressible means interspersed between the first and second tape layers for providing ease of separation between the tape layers and to accomodate sliding movements therebetween as the ship hull settles onto the docking blocks, and means for attaching the second tape layer to the docking blocks, and said first tape layer comprises an elastomeric matrix containing a two component system of resin-filled and activator-filled microspheres which fracture and mix together as the ship hull settles onto the docking blocks, said elastomeric matrix material, resin, and activator thereby combine to produce a coating layer which cures on the hull surface.

4,522,883

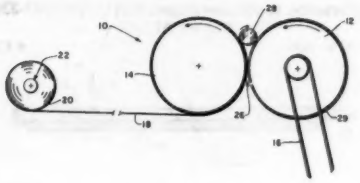
CIRCUMFERENTIALLY WRAPPED CARBON-CARBON STRUCTURE

Gary A. Wallace, and James E. Zimmer, San Jose, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 9, 1984, Ser. No. 578,335

Int. Cl.³ B64G *1/58*

U.S. Cl. 428—365 **10 Claims**



1. A method for fabricating a carbon-carbon nosetip preform for a re-entry vehicle which comprises the steps of:

a. providing a woven carbon fabric;

b. providing at least two uniaxial rods, each rod consisting essentially of a plurality of uniaxial carbon yarns and a resin binder;

c. gripping the leading edge of said fabric between said rods;

d. circumferentially winding said fabric around said rods under a desired tension to a desired diameter to form a roll;

e. securing the trailing edge of said fabric to prevent unwinding of said fabric;

f. impregnating said roll with pitch;

g. carbonizing the thus-impregnated roll;

h. graphitizing and thus-carbonized roll;

i. repeating said impregnating, carbonizing and graphitizing steps as necessary to achieve a desired material density.

6. A carbon-carbon composite structure consisting essentially of a central core, a plurality of layers of circumferentially wrapped woven carbon fabric, and a carbon binder, wherein said central core consists essentially of a plurality of longitudinally oriented carbon fibers.

4,522,884

PROCESS OF MELT SPINNING POLYPROPYLENE AND NOVEL ROUGH SURFACED FIBRES PRODUCED THEREBY

Harry Brody, Harrogate, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

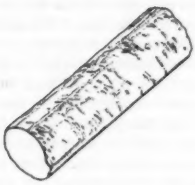
Continuation-in-part of Ser. No. 268,252, May 29, 1981, Pat. No. 4,442,266. This application Apr. 2, 1982, Ser. No. 365,024

Claims priority, application United Kingdom, May 13, 1981, 8114626; European Pat. Off., Mar. 19, 1982, 82301422.0

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—400 **4 Claims**



1. Fibres of polypropylene having a rough surface containing a small proportion of a polymer capable of forming an anisotropic melt in the temperature range at which polypropylene may be melt spun.

4,522,885

MAGNETIC RECORDING MEDIUM

Masaya Funahashi, Osaka; Kenichi Inoue, Muko, and Kunio Mizushima, Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Feb. 10, 1984, Ser. No. 579,169

Claims priority, application Japan, Feb. 12, 1983, 58-21935; Feb. 19, 1983, 58-26693; Feb. 19, 1983, 58-26694

Int. Cl.³ G11B *5/70, 5/82*

U.S. Cl. 428—422 **12 Claims**

1. A magnetic recording disc which comprises a disc substrate and a magnetic layer comprising magnetic powder and a resinous binder formed on the substrate, characterized in that the magnetic layer further comprises at least one lubricant chosen from hydrocarbons, fluorinated compounds and silicone compounds and at least one unsaturated fatty acid ester chosen from oleyl oleate and n-butyl oleate, the combined amount of the lubricant and the unsaturated fatty acid ester being from 0.1 to 40% by weight to the amount of the magnetic powder.

4,522,886

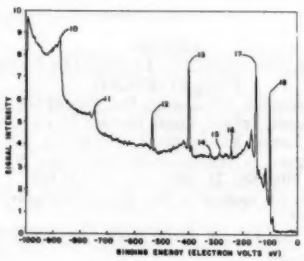
METHOD OF ION BEAM SYNTHESIS OF THIN SILICON NITRIDE FILMS AND RESULTING ARTICLES

Roland L. Chin, Williamsville, and Susan A. Ferguson, W. Seneca, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 9, 1984, Ser. No. 659,147

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—446 **14 Claims**



1. A method of synthesizing a thin insulating film on a silicon substrate which comprises:

(a) cooling the substrate

(b) selectively absorbing ammonia on the cooled substrate; and

(c) while still in the cooled condition, directing a fine ion beam of a noble gas on the ammonia treated substrate of step (b) to produce thereon the desired pattern of silicon nitride.

4,522,887

LAMINATED FILM OF BIAXIALLY ORIENTED POLYPROPYLENE AND AN OLEFIN POLYMER FILM

Mamoru Koebisu, Moriyama; Masayuki Shinzawa, Ohtsu, and Masatsugi Murakami, Moriyama, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,611

Claims priority, application Japan, Apr. 18, 1983, 58-66945; Jul. 11, 1983, 58-124842

Int. Cl.³ B32B *15/08, 27/08;* **B65D** *65/00*

U.S. Cl. 428—461 **14 Claims**

1. A laminated film comprising a biaxially oriented polypro-

pylene film (A) having an olefin polymer film (B) laminated on at least one surface thereof, said olefin polymer film (B) comprising 10 to 50% by weight of an ethylene component, the balance mainly comprising a propylene component, and having at least three peaks in the melting curve within the range of from 120° to 165° C. and a surface roughness Ra of from 0.2 to 1.5 μ.

4,522,888

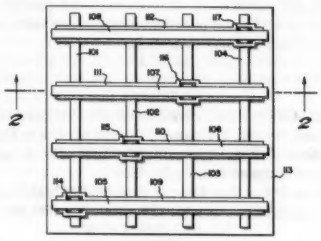
ELECTRICAL CONDUCTORS ARRANGED IN MULTIPLE LAYERS

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 220,341, Dec. 29, 1980, Pat. No. 4,416,914. This application May 25, 1983, Ser. No. 497,977

Int. Cl.³ C23C *3/02;* **H05K** *3/00*

U.S. Cl. 428—546 **19 Claims**



1. A multi-layer electrical conductor pattern adhered to an insulative substrate surface, comprising: a first conductor pattern fabricated upon said substrate surface; a layer of dielectric material covering at least part of said first conductor pattern; and a second conductor pattern comprising; a first polymer adhering to at least a portion of said dielectric layer and at least a portion of said first conductor pattern; a finely divided first metallic composition having a particle size greater than about 3 microns and less than about 50 microns and a second metal, both contained within said first polymer; and a contiguous layer of said second metal on said first polymer, wherein said second metal is more noble than the metal of said first metallic composition.

4,522,889

LIGHTNING PROTECTION COMPOSITE MATERIAL

Harold Ebneth, Leverkusen; Gerhard D. Wolf, Dormagen, and Henning Giesecke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,127

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301669

Int. Cl.³ H05F *1/02*

U.S. Cl. 428—614 **12 Claims**

1. A lightning protection composite material comprising a metallised textile sheetlike structure embedded in a plastics matrix, the sheetlike structure comprising C-containing fibre material to which have been applied in succession at least two, metal layers having a total surface resistance of less than 1 Ohm at least one metal layer is nickel and at least on metal layer is cooper.

4,522,890

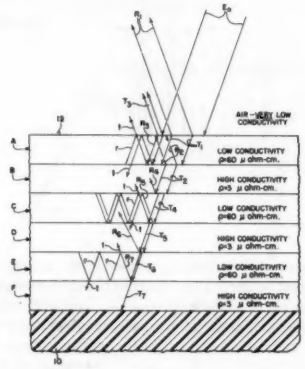
MULTILAYER HIGH ATTENUATION SHIELDING STRUCTURE

Jack C. Volkers, and William R. Conley, both of Elgin, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 328,987, Dec. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 89,435, Oct. 31, 1979, abandoned. This application Oct. 11, 1983, Ser. No. 540,106

Int. Cl.³ B21D *39/00;* **H01Q** *17/00*

U.S. Cl. 428—624 **7 Claims**


AIR — VERY LOW CONDUCTIVITY
LOW CONDUCTIVITY ρ=60 μ ohm-cm.
HIGH CONDUCTIVITY ρ=3 μ ohm-cm.
LOW CONDUCTIVITY ρ=60 μ ohm-cm.
HIGH CONDUCTIVITY ρ=3 μ ohm-cm.
LOW CONDUCTIVITY ρ=60 μ ohm-cm.
HIGH CONDUCTIVITY ρ=3 μ ohm-cm.

1. The combination of an electrically nonconductive substrate and a composite electro-magnetic shield structure, said shield structure disposed on one side of said substrate for shielding the opposite side of said substrate from electro-magnetic interference, said structure comprising a plurality of thin layers of conductive material, wherein each successive layer alternates from one having a relatively low skin depth and low electrical conductive resistivity to one having a relatively high skin depth and high electrical conductive resistivity and wherein the layers having a relatively low skin depth have a thickness of no less than the thickness of that particular material at its point of opacity in the radio frequency range.

4,522,891

SUPPORT FOR LITHOGRAPHIC PRINTING PLATE

Akio Iwaki; Norihito Suzuki; Takeshi Yamamoto, and Toru Aoki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,156

Claims priority, application Japan, Jun. 18, 1982, 57-105726

Int. Cl.³ B41K *1/50;* **B41N** *1/14*

U.S. Cl. 428—626 **17 Claims**

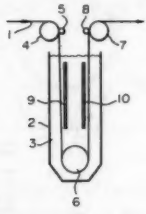
1. A support for a lithographic printing plate having provided on an iron material (i) a layer substantially consisting of at least one material selected from the group consisting of chromium and chromium oxide and (ii) a layer on said layer (i) consisting essentailly of (i') a water soluble polymeric compound and (ii') at least one salt selected from the group consisting of the water soluble salts of calcium, magnesium, zinc, barium, strontium, cobalt, manganese, nickel and silicon.

4,522,892

METHOD FOR PRODUCING A STEEL STRIP HAVING AN EXCELLENT PHOSPHATE-COATING PROPERTY

Yoshio Shindow; Masaya Tsutsumi; Wataru Hotta, and Yujiro Miyauchi, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 482,969
Claims priority, application Japan, Apr. 17, 1982, 57-64586
Int. Cl.³ C25D 11/36
U.S. Cl. 428—628 9 Claims



1. A method for producing a steel strip having one steel surface thereof exhibiting an excellent phosphate-coating property and the other surface thereof electroplated with a zinc-containing metallic material, comprising subjecting a steel strip having one steel surface and the other surface thereof electroplated with a zinc-containing metallic material to an electrolytic treatment in which said steel surface of said steel strip is brought into contact with an aqueous solution containing at least one phosphate selected from the group consisting of alkali metal phosphates and ammonium phosphate and having a concentration of phosphoric anions of 0.05 mole/l or more and a pH of from 4 to 7, the steel surface portion of said steel strip serves as an anode, the electrical potential of said anode is adjusted to a level at which the iron in the steel strip enters an overpassive state and the anode current density is adjusted to 2 A/dm^2 or more, to an extent that the steel surface of said steel strip is made clean and a phosphate surface layer is formed in an amount of from 0.0001 to 0.05 g/m^2 on the steel surface of said steel strip.

9. A steel strip produced by the method as claimed in any one of claims 1 to 8, which steel strip has one steel surface thereof exhibiting an excellent phosphate-coating property and the other surface thereof electroplated with a zinc-containing metallic material.

4,522,893

CONTACT DEVICE FOR RELEASABLY CONNECTING ELECTRICAL COMPONENTS

Harald Bohlen, Boeblingen; Gerhard Kaiis, Moetzingen; Johann Greschner, Pliezhausen; Joachim H. Keyser, Wildberg, and Werner Kiilcke, Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

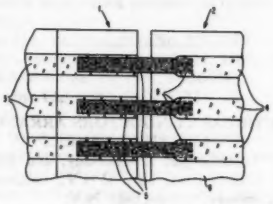
Filed Oct. 12, 1982, Ser. No. 433,611
Claims priority, application European Pat. Off., Oct. 30, 1981, 81109371.5
Int. Cl.³ H01J 17/00
U.S. Cl. 428—641 8 Claims

1. A pressure contact connection structure for electrically connecting electrical components where each component has a series of closely spaced terminals along the edges of the top surface thereof comprising,

a series of parallel, protruding, spaced fingers extending outwardly from the top surface of the first of said components, said fingers formed of low resistively monocrystalline silicon and being integral with said first component, said fingers electrically connected to said terminals on said first component

an abutment surface on the second of said components that is depressed from said top surface,

a plurality of closely spaced terminals on the surface of said second component above said abutment surface, which terminal spacing corresponds to the spacing of said fingers,



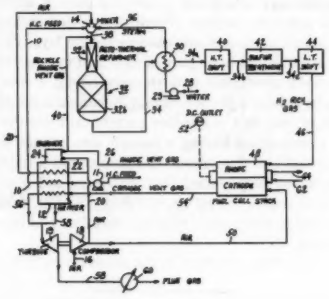
said first and second components assembled with a bottom surface of said first component in engagement with said abutment surface on said second component and said plurality of fingers in flexed engagement with said terminals on said second component.

4,522,894

FUEL CELL ELECTRIC POWER PRODUCTION

Herng-Shinn Hwang, Livingston; Ronald M. Heck, Frenchtown, and Robert M. Yarrington, Westfield, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 430,455, Sep. 30, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 599,865
Int. Cl.³ H01M 8/04
U.S. Cl. 429—17 23 Claims



1. A process for generating electricity from a fuel cell means, said fuel cell means comprising a stack of anodes and cathodes and having an anode side and a cathode side, each side dimensioned and configured for the passage of respective gas streams therethrough, said fuel cell means being fueled by a hydrogen-rich gas derived by treating a hydrocarbon feed in a reformer having first and second catalyst zones as defined below, the process comprising:

(a) preheating an inlet stream comprising a hydrocarbon feed, H_2O and air to a preheat temperature sufficiently high to initiate catalytic oxidation of said hydrocarbon feed as defined below;

(b) introducing the preheated inlet stream into the first catalyst zone comprising a monolithic body having a plurality of gas flow passages extending therethrough and containing a catalytically effective amount of palladium and platinum catalytic components dispersed therein, the amount of hydrocarbon feed, H_2O and air introduced into said first catalyst zone being controlled to maintain an H_2

O to C ratio of from at least about 0.5 to about 5 and an O_2 to C ratio of from about 0.3 to 0.4 in said inlet stream;

(c) contacting the preheated inlet stream within said first catalyst zone with said palladium and platinum catalytic components to initiate and sustain therein catalytic oxidation of said hydrocarbon feed to produce hydrogen and carbon oxides therefrom, the temperature of at least a portion of said monolithic body being at least about 250° F. (139° C.) greater than the temperature of said inlet stream, and oxidizing in said first catalyst zone a quantity, less than all, of said hydrocarbon feed, which quantity is sufficient (i) to attain a temperature within said first catalyst zone sufficiently high to crack substantially all unoxidized C_5 or heavier hydrocarbons, if any, therein to C_1 to C_4 hydrocarbons, and (ii) to heat such first zone effluent to a elevated temperature high enough to catalytcally steam reform, within a second catalyst zone defined below, the hydrocarbon remaining in such first zone effluent without supplying external heat thereto;

(d) passing the first zone effluent, while still at an elevated temperature, from said first catalyst zone to the second catalyst zone containing a platinum group metal steam reforming catalyst therein, and contacting the first zone effluent in said second catalyst zone with said steam reforming catalyst to react hydrocarbons therein with H_2O to produce hydrogen and carbon oxides therefrom;

(e) withdrawing the effluent of said secon catalyst zone as a hydogen-rich gas and passing said hydrogen-rich gas to the anode side of said fuel cell means;

(f) introducing an air stream to the cathode side side of said fuel cell means; and

(g) operating said fuel cell means to generate therefrom output electricity, a hydrogen-containing anode vent gas, and a cathode vent gas.

4,522,895

MULTILAYER FUEL CELL ELECTRODE SUBSTRATE HAVING ELONGATED HOLES FOR FEEDING REACTANT GASES

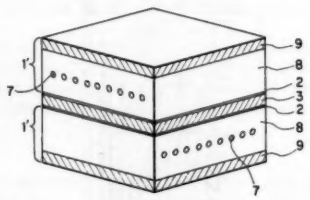
Masatomo Shigeta; Hiroyuki Fukuda; Kuniyuki Saitoh, and Hisatsugu Kaji, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,913

Claims priority, application Japan, Oct. 5, 1982, 57-174960; Oct. 12, 1982, 57-178770; Nov. 24, 1982, 57-205628

Int. Cl.³ H01M 4/96

U.S. Cl. 429—44 **14 Claims**



1. A carbonaceous electrode substrate for a fuel cell, comprising:

a dense layer having an average bulk density of not less than 1.0 g/cm³ and a specific gas permeability of not more than 0.2 ml/cm. hr. mmAq;

a porous layer of a uniformly porous carbonaceous material having an average bulk density of not less than 1.0 g/cm³ and a specific gas permeability; of 0.3–1.0 g/cm³ and a specific gas permeability of not less than 20 ml/cm. hr. mmAq;

the thickness of said dense layer being not more than half of the thickness of said electrode substrate;

a plurality of holes extending between two parallel sides of said porous layer and parallel to the surface of said electrode substrate, said holes being provided near the center of the thickness direction of said porous layer and having a circular cross section.

4,522,896

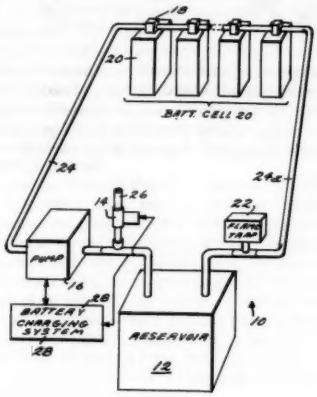
AUTOMATIC WATERING SYSTEM FOR BATTERIES AND FUEL CELLS

Barry S. Iseard, Freeport, The Bahamas, assignor to Anglo-American Research Ltd., Freeport, The Bahamas

Filed Mar. 23, 1983, Ser. No. 478,091

Int. Cl.³ H01M 2/36

U.S. Cl. 429—63 **3 Claims**



1. A watering system for a battery having at least one cell said system comprising:

an electrolyte reservoir;

at least one pump;

a respective watering cap associated with the watering aperture of each said cell;

a flame trap;

interconnecting means for selectively interconnecting said reservoir, said pump, each said respective watering cap, and said flame trap to form an essentially closed system;

said interconnecting means including gas purging means for selectively opening said closed system to the atmosphere, displacing electrolyte in said system outside of said cells with air and venting gases in said system through said flame trap;

each respective watering cap comprising:

a body, adapted for cooperation with said cell and including a hollow chamber,

an inlet and an outlet, communicating with said chamber and adapted for cooperation with said interconnecting means, said inlet and outlet having relatively large diameter;

an air displacement conduit having an upper portion extending into said chamber and a lower portion disposed to extend a predetermined distance into said cell, and

a watering conduit, communicating between said chamber and said cell, having a relatively small cross-sectional area.

4,522,897

ROPE BATTERIES

Myles A. Walsh, Falmouth, Mass., assignor to Cape Cod Research, Inc., Buzzards Bay, Mass.

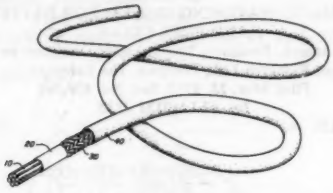
Filed Oct. 14, 1983, Ser. No. 541,902

Int. Cl.³ H01M 6/34

U.S. Cl. 429—119 **15 Claims**

1. A structure for a rope battery employing sea water as the electrolyte comprising a flexible rope which is relatively long

compared to its diameter and which consists essentially of a flexible inner core, wherein said inner core comprises at least one continuous, flexible, solid wire, wherein said inner core is surrounded by a thin, porous, flexible insulating separator



sleeve which is in turn surrounded by a thin outer flexible layer consisting essentially of twisted, felted or braided strands of metal or graphite, and wherein said inner core consists essentially of corrodible material selected from the group comprising magnesium, aluminum, zinc, and alloys thereof.

4,522,898

HIGH-TEMPERATURE STORAGE BATTERY

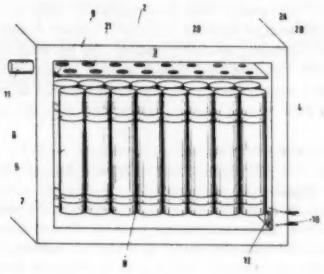
Hilmar Esrom, Bammental, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 563,023

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247969

Int. Cl.³ H01M *2/00*

U.S. Cl. 429—120 **13 Claims**



1. High-temperature storage battery comprising a double-walled housing with insulating material between the two walls of the housing, at least one module disposed in the interior of the housing containing a plurality of storage cells with empty spaces between the storage cells, at least one distributor in the module for distributing a fluid cooling medium to the storage cells in the module, a feedline connected to the fluid cooling medium for the introduction of the cooling medium to the storage cells, said distributor arranged between the feedline of the cooling medium in the module and the upper ends of the storage cells, formed of a continuous plate provided with openings arranged above the empty spaces between the storage cells.

4,522,899

GAS AND LIQUID TIGHT POLE SEAL FOR ELECTRIC STORAGE BATTERIES, PARTICULARLY LEAD STORAGE BATTERIES

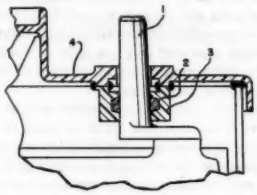
Joachim Illmann, and Klaus Gummelt, both of Garbsen, Fed. Rep. of Germany, assignors to Varta Batterei A.G., Hanover, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 532,704

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236370

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—181 **7 Claims**



1. For an electric storage battery having a pole shaft extending therefrom, particularly a lead storage battery having a case formed of plastic, a gas and liquid tight pole seal wherein a first, ring-shaped molding formed of an elastic thermoplastic synthetic surrounds the pole shaft, and a second molding formed of a less elastic plastic material completely surrounds the first molding.

4,522,900

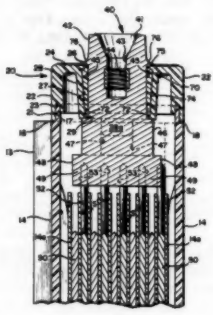
BATTERY CELL

Santiago Mejia, 525 N. Ocean Blvd., Apt. 1024, Pompano Beach, Fla. 33062

Filed Nov. 1, 1983, Ser. No. 547,626

Int. Cl.³ H01M *2/02*

U.S. Cl. 429—181 **10 Claims**



1. A battery cell, comprising:

(a) a battery case containing a plurality of battery plates and having a positive terminal and a negative terminal which extend through terminal receiving openings and are integral with the battery plates,

(b) the battery case having a terminal receiving assembly for each terminal at the terminal receiving opening which includes and a depending flange which is concentrically disposed with respect to the terminal receiving openings with a compressible seal which is pressed into tight sealing engagement with the battery terminal at the time the terminal is mounted into the receiving assembly,

(c) each terminal having an internal engaging element dis-

posed along its central axis and accessible from the top of the terminal, and

(d) the upper outer external surface of the terminals being pliable and forming a locking fillet which extends radially outwardly over the casing upper surface adjacent the opening such that the terminal is held in firm locking engagement with respect to the terminal receiving assembly when the terminal is pulled upwardly into final locking position by means of the grasping element.

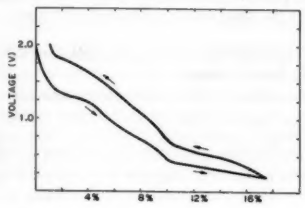
4,522,901
SECONDARY BATTERY CONTAINING ORGANOBORATE ELECTROLYTE

Lawrence W. Shacklette, Maplewood, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 475,995, Mar. 16, 1983, abandoned. This application Nov. 30, 1983, Ser. No. 556,721

Int. Cl.³ H01M *10/40*

U.S. Cl. 429—194 **30 Claims**



1. A secondary battery comprising:

(a) an electrolyte comprising a solution of a salt of the formula

$$MBR_{4-w-y-z}R'_wR''_yX_z$$

wherein M is an alkali metal, B is boron R is alkyl, R′ is aryl or alkyl-substituted aryl, R″ is a heterocycle, X is F, Cl, Br, I, CN, OCN, SCN, perfluoroalkyl, fluoroaryl or perfluoroalkyl-substituted aryl and w and y are integers of 0 to 4, and z is an integer of 0 to 4, provided that when X is solely F, Cl, I, Br, CN, OCN, SCN or perfluoroalkyl, z is not 4; with the sum w+y+z being equal to or less than 4;

(b) an anode containing a conjugated backbone polymer which, in a reduced state, has a potential of between about 0.1 V and about 0.5 V (relative to M/M^+) and

(c) a cathode which is separated from the anode.

4,522,902
POLYMERIC BATTERY SEPARATORS

Robert J. Minchak, Parma Heights, and William N. Schenk, Peninsula, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 14, 1984, Ser. No. 609,941

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—252 **19 Claims**

1. Battery separators comprising cross-linked block copolymers of haloalkyl epoxides and hydroxyl terminated alkadiene polymers, said block copolymers having the formula H-O-A_b-O-B-O-A_b-O-H wherein A represents residues of the haloalkyl epoxides, b is an integer of at least 3, B represents residues of the hydroxyl terminated alkadiene polymers, and at least 25 weight percent of the halogen atoms on the haloalkyl epoxide residues are in the form of alkylammonium halides of the formula $-N^+R_3X^-$ wherein X is the halogen atom and R is hydrogen or radicals containing 1 to 30 carbon atoms.

4,522,903
SEQUENTIAL AUTOMATIC REGISTRATION AND IMAGEWISE EXPOSURE OF A SHEET SUBSTRATE

Robert B. Heiart, Middletown, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1982, Ser. No. 387,536

Int. Cl.³ G03F *9/00*

U.S. Cl. 430—22 **27 Claims**

1. A process of registering and imagewise exposing a sheet substrate containing a photosensitive layer with the use of a sequence of related photomasks comprising the steps of:

(1) advancing the substrate containing a photosensitive layer to a position in a device to undertake in either order or concurrently the steps of:

(a) aligning the substrate and a photomask of the sequence in a predetermined relationship to one another through a hinged relationship of the photomask and the substrate to permit substantially identical alignment of the substrate and each photomask of the sequence;

(b) applying a liquid between the photosensitive layer and the photomask;

(2) contacting through the liquid the substrate containing the photosensitive layer and the photomask wherein liquid between the photosensitive layer and the photomask is displaced when the substrate and photomask are brought into more intimate contact by an advancing pressure line whereby during said contacting substantially no movement of the photosensitive layer relative to the photomask occurs other than a more intimate contact due to displacement of the liquid in a liquid layer whereby at least one of interfacial or viscous force due to the liquid layer aids in holding the photosensitive layer and photomask in a fixed position relative to one another;

(3) exposing the photosensitive layer to actinic radiation through said photomask, causing an image to be formed thereon;

(4) removing the photomask from the exposed photosensitive layer;

(5) modifying the surface of the exposed photosensitive layer;

(6) repeating steps 1 to 5 for each of the remaining photomasks of said sequence.

4,522,904
ELECTROPHOTOGRAPHIC PROCESS

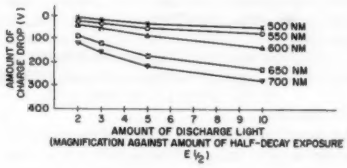
Hideki Kina; Toshiyuji Iijima, both of Nagano; Eizo Tanabe, Kanagawa; Toyoki Kazama, Kanagawa, and Masaharu Namba, Kanagawa, all of Japan, assignors to Fuji Electric Company, Ltd. and Fuji Electric Corporate Research & Development, Ltd., both of Kanagawa, Japan

Filed Sep. 23, 1982, Ser. No. 421,852

Claims priority, application Japan, Oct. 8, 1981, 56-160802; Oct. 8, 1981, 56-160803

Int. Cl.³ G03G *13/00*

U.S. Cl. 430—54 **10 Claims**



1. An electrophotographic process employing a photosensitive member having a layer of hydrogen-containing amorphous silicon comprising the steps of:

exposing the surface of the photosensitive member to a substantially uniform charge stabilization light composed

primarily of light having a wavelength above 600 nm at least once for charge stabilization treatment; and

thereafter effecting a series of image-producing operations without charge stabilization treatment.

4,522,905

AMORPHOUS SILICON PHOTOCONDUCTIVE MEMBER WITH INTERFACE AND RECTIFYING LAYERS

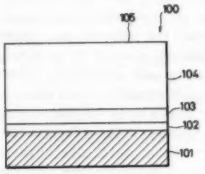
Kyosuke Ogawa; Shigeru Shirai; Junichiro Kanbe; Keishi Saitoh; Yoichi Osato, and Teruo Misumi, all of c/o Canon Kabushiki Kaisha, 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,895

Claims priority, application Japan, Feb. 5, 1982, 57-17210; Feb. 5, 1982, 57-17211; Feb. 5, 1982, 57-17212; Feb. 9, 1982, 57-16583; Feb. 24, 1982, 57-28376; Feb. 24, 1982, 57-28377; Feb. 24, 1982, 57-28378; Feb. 24, 1982, 57-28379

Int. Cl.³ G03G *5/082, 5/14, 5/09*

U.S. Cl. 430—60 **19 Claims**



1. A photoconductive member which comprises a support for the photoconductive member, an interface layer constituted of an amorphous material containing at least silicon atoms and nitrogen atoms as constituent atoms, a rectifying layer comprising an amorphous material containing atoms (A) belonging to Group III or Group V excepting nitrogen of the Periodic Table as constituent atoms in a matrix of silicon atoms and an amorphous layer exhibiting photoconductivity constituted of an amorphous material containing at least one of hydrogen atoms or halogen atoms as constituent atoms in a matrix of silicon atoms, said rectifying layer having a layer thickness t which is from 30 Å up to, but not reaching, 0.3μ and the content C(A) of said aforesaid atoms contained in the rectifying layer being 30 atomic ppm or more, or said t being 30 Å or more and said C(A) being from 30 atomic ppm, up to, but not reaching, 100 atomic ppm.

4,522,906

ELECTROPHOTOGRAPHIC PLATE-MAKING MATERIAL

Yasuzi Asao, Shizuoka, and Ichiro Yamamoto, Chiba, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1984, Ser. No. 599,050

Claims priority, application Japan, Apr. 11, 1983, 58-63407

Int. Cl.³ G03G *13/28, 5/08, 5/00*

U.S. Cl. 430—60 **22 Claims**

1. An electrophotographic plate-making material comprising a paper support and a photoconductive layer, said support being prepared by providing a polyolefin resin layer on both surfaces of a paper substrate by molten extrusion lamination, wherein the volume resistance of the support is not more than 10^{10} Ω, and the polyolefin resin layer contains electrically conductive carbon black having a loss on drying, as determined under the conditions of 110° C. and 2 hours, of not more than 1.0%.

4,522,907

METHOD FOR DEVELOPING LATENT IMAGES USING RESIN DONOR MEMBER

Yasuo Mitsuhashi, Yokohama, and Ichiro Ohsaki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 398,543, Jul. 15, 1982, abandoned, which is a continuation of Ser. No. 204,874, Nov. 7, 1980, abandoned. This application Sep. 2, 1983, Ser. No. 529,125

Claims priority, application Japan, Nov. 14, 1979, 54-147520; Nov. 14, 1979, 54-147521; Nov. 28, 1979, 54-154856; Dec. 26, 1979, 54-169572; Feb. 15, 1980, 55-17402; Aug. 6, 1980, 55-108741; Oct. 13, 1980, 55-143250; Oct. 13, 1980, 55-143255

Int. Cl.³ G03G *13/08, 15/08*

U.S. Cl. 430—102 **12 Claims**

1. A method for developing electrostatic latent images with a triboelectrified insulating toner without the use of carrier particles therefor which comprises:

forming a toner layer by applying a toner, having a conductivity on the order of 10^{-14} mhos/cm or lower, thinly to a toner-holding member;

imparting triboelectric charges to said toner by the friction between the toner-holding member surface and said toner; and

bringing the toner layer into facing proximity with the electrostatic latent image;

at least the surface of the toner-holding member containing 10% by weight or more of at least one member selected from the group consisting of polyphenylene oxide, polycarbonate, styrene type resin, silicone resin having a three-dimensional structure, polymer of vinyl ester type monomer, silane compound, and polyethersulfone.

4,522,908

LIQUID ELECTROPHORETIC DEVELOPER

Walter F. de Winter, 's-Gravenwezel; Herman J. Uytterhoeven, Bonheiden; Yvan K. Gilliams, Hever, and Noël J. De Volder, Edegem, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jun. 6, 1984, Ser. No. 617,708

Claims priority, application European Pat. Off., Jun. 10, 1983, 83200852.8

Int. Cl.³ G03G *9/12*

U.S. Cl. 430—114 **12 Claims**

1. A liquid electrophoretic developer composition suitable for rendering visible electrostatically charged areas, which composition contains in an electrically insulating non-polar organic carrier liquid having a volume resistivity of at least 10^9 ohm.cm and a dielectric constant less than 3, pigment particles carrying at least one substance conferring electric charges on said particles, dispersed with the aid of a block copolymer containing one adsorbent group A and at least one solvatable group B, characterized in that said group A is a polystyrene chain having a number average molecular weight of at least 2,000 and group B is a polymethacrylate fatty alcohol ester group having a number average molecular weight of at least 7,000.

4,522,909

PROCESS FOR PREPARING ELECTROSTATIC DEVELOPER

Toshiaki Narusawa, Sagamihara; Seiji Okada, Kawasaki; Kiyohide Muramatsu, Tokyo; Teruo Yagishita, Yokohama, and Hirofumi Okuyama, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 232,805, Feb. 9, 1981, abandoned, which is a continuation of Ser. No. 62,311, Jul. 20, 1979, abandoned. This application Jun. 7, 1983, Ser. No. 501,800

Claims priority, application Japan, Aug. 1, 1978, 53-93110; Mar. 26, 1979, 54-34221

Int. Cl.[3] G03G *11/00, 9/10*

U.S. Cl. 430—137 41 Claims

1. A process for preparing a developer for electrostatic images comprising the steps of:

(1) immersing carrier beads in an organic solution of a resin coating material comprising a butadiene homopolymer which is 1,2-polybutadiene or cyclized cis-1,4-polybutadiene or a mixture thereof, or a mixture of at least one of said homopolymers and a styrene butadiene copolymer, each said homopolymer having a molecular weight of from 10,000 to 100,000, said mixture containing from 7.5% to 100%, based on the wieght of said mixture, of butadiene in polymerized form and from 0.1 to 10 parts by weight of an organic peroxide based on 100 parts by weight of said resin coating material, and, then evaporating the organic solvent of said solution, drying said immersed beads, and curing said resin coating material by a rotary drying method, comprising steps wherein said immersed beads are put in a vessel and heated while the vessel rotates so as to avoid the aggregation of the coated carrier particles with each other, to form a resin coating on said carrier beads;

(2) blending toner materials at a temperature sufficient to form a toner mass, said toner materials comprising:

(a) from 85% to 95% of a binder resin, based on the weight of said toner materials, comprising, based on the weight of said binder resin, from 50% to 100% by weight of an epoxy resin of a molecular weight of from 900 to 8,000 and up to 50% of a styrene alkylmethacrylate copolymer, said alkyl group having from 1 to 4 carbon atoms, and being of a molecular weight of from 10,000 to 100,000,

(b) a colorant comprising, based on the weight of said toner materials, up to 10% of fine carbon and from about 0.5% to 8% of nigrosine dye, and

(c) up to 8% of a charge controlling agent, based on the weight of said toner materials, wherein said charge controlling agency comprises a control material which is quaternary ammonium alkylsulfonate, said alkyl group having from 4 to 20 carbon atoms, di-(polyhydroxy ethoxy ethyl) octadecyl amine, or a polyamine; and

(d) up to 1% of montan wax based on the weight of said toner materials;

(3) pulverizing said blended toner mass to form toner particles and mixing the obtained toner particles with said coated carrier, the ratio of the total surface area of said carrier to the total projection area of said toner particles being in the range of from 1:0.5 to 1:2.0.

4,522,910

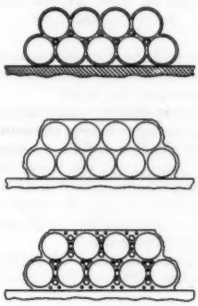
PHOTOSENSITIVE GRAPHIC ARTS ARTICLE

Robert W. Hallman, San Diego, Calif., assignor to Napp Systems (USA), Inc., San Marcos, Calif.

Continuation of Ser. No. 51,652, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 815,899, Jul. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 588,334, Jun. 19, 1975, abandoned. This application Nov. 18, 1982, Ser. No. 442,515

Int. Cl.[3] G03C *1/54, 1/60, 1/76*

U.S. Cl. 430—157 7 Claims



1. A graphic arts article comprising a plastic substrate having applied on at least one side thereof a unilayer photosensitive film structure cast from an emulsion-dispersion and comprising a generally continuous phase and a generally discontinuous phase uniformly dispersed throughout the entire film structure, said continuous phase being a minor constituent by weight of said film structure and including a photosensitive diazo compound whose solubility with respect to a given aqueous developer is changed upon exposure to electro-magnetic radiation, said discontinuous phase comprising a polymeric particulate material which is substantially insoluble in said aqueous developer, said film structure having a maximum thickness not greater than ten microns, and said film structure being selectively developable to produce an image after exposure by dissolution and removal of the soluble portion of said continuous phase by said aqueous developer.

4,522,911

DEEP ULTRA-VIOLET LITHOGRAPHIC RESISTS WITH DIAZOHOMOTETRAMIC ACID COMPOUNDS

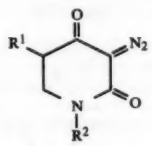
Nicholas J. Clecak; Dennis R. McKean; Robert D. Miller, all of San Jose; Terry C. Tompkins, Los Altos, and Carlton G. Willson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1983, Ser. No. 508,642

Int. Cl.[3] G03C *1/54, 1/60;* C07C *113/00*

U.S. Cl. 430—192 7 Claims

1. A lithographic resist composition for use with ultra-violet light of less than 300 nm wavelength, said composition comprising an acidic resin and in admixture therewith as a deep ultra-violet sensitizer a sufficient quantity of a diazohomotetramic acid compound having the formula



wherein R^1 is hydrogen or an alkyl group and R^2 is an arylalkyl

group, an aryl group, or a bifunctional group linking two of the rings together,

whereby upon exposure to deep ultra-violet radiation, the composition becomes more soluble in alkaline developer.

4,522,912

PHOTOPOLYMER COATED LITHOGRAPHIC PRINTING PLATE

Frank L. Sharkozy, Racine, and James A. Kiesler, Somers, both of Wis., assignors to Printing Developments, Inc., Racine, Wis.

Filed Jan. 28, 1983, Ser. No. 462,104
Int. Cl.³ G03C *1/94*
U.S. Cl. 430—278 **5 Claims**

1. A lithographic printing plate comprising

a sheet metal base substrate selected from the group consisting of aluminum alloy and steel,

a layer of chromium directly electrodeposited thereon of rough craglike character having numerous closely packed projections and adjacent surface recesses therein,

a thin, glasslike, transparent and water insoluble film disposed in bridging relation at least in the nether portions of said surface recesses in said chromium layer comprising the cured residue of an applied water solution of ammonium-zirconium carbonate and

a coating of photopolymer material disposed in over-lying interfacial relation with said film coated chromium surface.

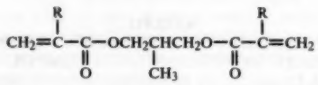
4,522,913

MONOACRYLATE OR DIACRYLATE OF 2-METHYL-PROPYLENE GLYCOL AND PHOTOSENSITIVE COMPOSITION CONTAINING THE DIACRYLATE

Tatsuya Kanno, and Yuzo Toga, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 418,119, Sep. 14, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 623,613
Claims priority, application Japan, Sep. 17, 1981, 56-147099; Sep. 28, 1981, 56-153449; Sep. 28, 1981, 56-153450
Int. Cl.³ C08F *2/50*
U.S. Cl. 430—285 **3 Claims**

1. A photosensitive composition which comprises, as the active photopolymerizable substance, one or a mixture of two or more compounds having the formula



wherein R is hydrogen or methyl, or low molecular weight polymers thereof having a degree of polymerization of up to 5, said composition also containing polymeric filler and a sensitizer.

4,522,914

IMAGING METHOD OF MAKING A RAISED LINE FACSIMILE OF A PHOTOGRAPHIC IMAGE

Austin E. Brooks, Jr., Crawfordsville, Ind., assignor to Wabash College, Crawfordsville, Ind.

Filed Oct. 22, 1982, Ser. No. 435,931
Int. Cl.³ G03C *7/00, 7/12*
U.S. Cl. 430—320 **10 Claims**

1. A method for making a raised line facsimile of a photographic image, said facsimile being suitable for use by visually handicapped individuals in lieu of said photographic image to enable said individuals to acquire an understanding of the subject matter of said photographic image, said method comprising:

(a) providing a positive copy of said photographic image on a transparent substrate, said copy being of sufficient size, detail, contrast and quality to yield a raised line facsimile, said facsimile having tactilely distinguishable raised and lowered portions, and being capable of conveying accurate information about the subject matter of said photographic image to said individuals;

(b) preparing a faithful negative reproduction of said image from said positive copy on a silkscreen;

(c) printing a positive facsimile of said image using said screen and a polymerizable printing ink; and

(d) treating said positive facsimile under conditions sufficient to polymerize said ink, and create said raised line facsimile.

4,522,915

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIALS CONTAINING NOVEL MAGENTA COLOR-FORMING COUPLERS

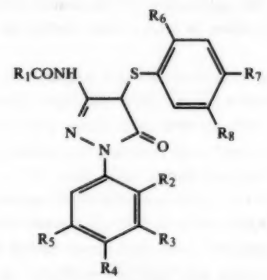
Seiji Ichijima, and Toshiyuki Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 24, 1983, Ser. No. 497,636
Claims priority, application Japan, May 24, 1982, 57-87798
Int. Cl.³ G03C *1/46*
U.S. Cl. 430—505 **7 Claims**

1. A color photographic silver halide light-sensitive material, comprising:

a support base having positioned thereon;

a silver halide emulsion layer, containing a silver halide dispersed within a binder and further containing a 5-pyrazolone magenta coupler represented by the general formula (I):



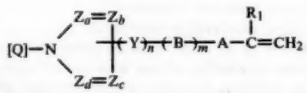
wherein R_1 is an ethyl group, a methyl group, a n-propyl group, a n-butyl group, a cyclopropyl group, a cyclobutyl group, an isopropyl group, an isobutyl group, or a 1-methylpropyl group, or an ethyl group, a methyl group, a n-propyl group, a n-butyl group, a cyclopropyl group, a cyclobutyl group, an isopropyl group, an isobutyl group, or a 1-methylpropyl group, which are substituted by an alkoxyl group containing from 1 to 4 carbon atoms, an alkylthio group containing from 1 to 4 carbon atoms, a hydroxyl group, an amino group, or a halogen atom; R_2 R_3, R_4, and R_5 are each a hydrogen atom, a halogen atom, an alkyl group containing from 1 to 4 carbon atoms, an alkoxy group, an alkylthio group, an acylamino group, an alkoxycarbonyl group, an alkylaminocarbonyl group, or a dialkylaminocarbonyl group; and R_6, R_7, and R_8 are each a substituent selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group containing from 1 to 32 carbon atoms, an alkoxy group, an alkylthio group, an acylamino group, an alkoxycarbonyl group, a dialkylaminocarbonyl group, an aryl group containing from 6 to 10 carbon atoms, and an amino group so that the total number of carbon atoms contained in R_6, R_7, and R_8 is from 8 to 32.

4,522,916
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsumoru Hirano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 24, 1984, Ser. No. 643,928
Claims priority, application Japan, Aug. 24, 1983, 58-154484
Int. Cl.³ G03C 7/26
U.S. Cl. 430—548 **19 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a magenta color image forming polymer coupler latex which is capable of forming a dye upon coupling with an oxidation product of an aromatic primary amine developing agent and which is a homopolymer or copolymer having a repeating unit derived from a monomer represented by formula (I)



(I)

wherein [Q] represents a magenta color image forming coupler residue wherein the coupling active position is substituted for the remainder of the monomer molecule of formula (I); Za, Zb, Zc and Zd, which are the same or different, each represents a methine group, a substituted methine group, or —N═; R_1 represents a hydrogen atom, a lower alkyl group having from 1 to 4 carbon atoms or a chlorine atom; A represents —NHCO—, —OCO—, or a phenylene group; Y represents —O—, —NH—, —S—, —SO—, —SO_2—, —CONH—, —COO—, —NHCO—, or —NHCONH—; B represents an unsubstituted or substituted straight or branched chain alkylene group, an unsubstituted or substituted aralkylene group or an unsubstituted or substituted phenylene group; m represents 0 or 1; and n represents 0 or 1, provided that when n represents 1, m represents 1 and when n represents 0, m represents 0 or 1.

4,522,917
PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Seiji Ichijima; Keiji Mihayashi, and Isamu Itoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1983, Ser. No. 553,262
Claims priority, application Japan, Nov. 19, 1982, 57-203446
Int. Cl.³ G03C 1/46, 1/02
U.S. Cl. 430—564 **16 Claims**

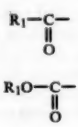
1. A photographic silver halide light-sensitive material, comprising:

a support base having thereon:

a silver halide emulsion layer and another layer; wherein at least one of said layers contains a compound represented by the general formula (I):

(I)

wherein A represents a group capable of undergoing cleavage on application of alkali hydrolysis and represents a group selected from the following:



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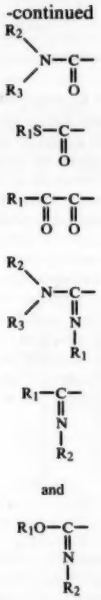
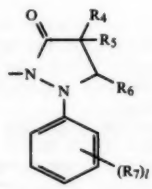


and

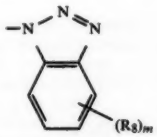
wherein R_1 is an aliphatic group containing from 1 to 22 carbon atoms, an aromatic group containing from 6 to 10 carbon atoms or a heterocyclic group; and

R_2 and R_3 are each a hydrogen atom, an aliphatic group containing 1 to 22 carbon atoms, an aromatic group containing 6 to 10 atoms, or a heterocyclic group, and R_2 and R_3 may combine together to form a ring; and

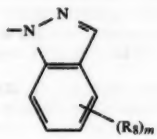
wherein Z is a group selected from the following:



(II)

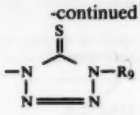


(III)



(IV)

-continued



(V)

wherein R_4, R_5 and R_6 independently represent a hydrogen atom, an aliphatic group, or an aromatic group;

R_7 represents an amino group, an alkoxyl group, an aryloxy group, a hydroxyl group, an alkyl group, an aryl group, a halogen atom, a carbonamide group, a sulfonamide group, an alkanoyloxy group, a benzoyloxy group, a ureido group, a carbamate group, a carbamoyloxy group, a carbonate group, or a carboxyl group;

R_8 may represent the same groups as R_7 and, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, a sulfamoyl group, an alkanoyl group, a benzoyl group, an alkylsulfonyl group, an arylsulfonyl group, a cyano group, a sulfo group or a nitro group;

R_9 represents an aliphatic group or an aromatic group;

l represents 0 or an integer of from 1 to 5; and

m is 0 or an integer of from 1 to 4.

4,522,918

PROCESS FOR PRODUCING MONOCLONAL ANTIBODIES REACTIVE WITH HUMAN BREAST CANCER

Jeffery Schlom, 404 Victoria Ct., NW.; David Colcher, 2587 Rambling Rd., both of Vienna, Va. 22180; Marianna Nuti, 9010 Lindale Dr., Bethesda, Md. 20034; Patricia H. Hand, 1113 E. Capital St., SE., Washington, D.C. 20003, and Faye Austin, 8204 Toll House Rd., Annandale, Va. 22003

Filed Dec. 15, 1981, Ser. No. 330,959

Int. Cl.³ C12P *21/00;* **C12N** *5/00, 15/00;* **G01N** *33/54;* **A61K** *49/00, 39/00;* **C12R** *1/91*

U.S. Cl. 435—68 **7 Claims**

1. A process for producing antibodies from hyridoma cultures comprising the steps of

(1) taking splenic lymphocytes of mice previously immunized with membrane-enriched fractions of immunoglobulin-depleted cancer cells;

(2) fusing the lymphocytes with murine myeloma cell line, and

(3) culturing the cell line in an in vitro culture medium or in vivo therefor to produce antibodies, which antibody:

(a) reacts and binds with extracts from human metastatic mammary carcinoma cells from involved livers but not with liver cell extracts;

(b) reacts and binds with at least one of the mammary carcinoma cell lines, BT-20, MCF-7, ZR-75-1, but not with lung, vulva epidermoid or oral epidermoid and not with rhabdomyosarcoma, fibrosarcoma and melanoma; and

(c) does not react with normal cells derived from breast, skin, lung, bone marrow, kidney, spleen and uterus.

4,522,919

METHOD OF PRODUCING ANTIBACTERIAL AGENTS AND BIOCONVERTING MICROORGANISM THEREFOR

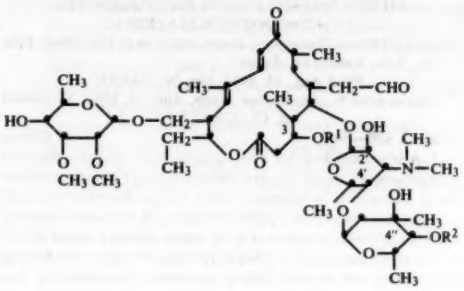
Barbara B. Shreve, Indianapolis, and Jan R. Turner, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 3, 1983, Ser. No. 471,928

Int. Cl.³ C12P *17/18;* **C12R** *1/465*

U.S. Cl. 435—119 **4 Claims**

3. A method of producing a compound of the formula



wherein

R^1 is hydrogen, acetyl or propionyl;

R^2 is hydrogen, n-butyryl or isovaleryl;

provided that one of R^1 or R^2 must be other than hydrogen, which comprises contacting tolysin with an acyl donor in the presence of an acylating enazyme system from that produced by *Streptomyces thermotolerans* NRRL 15270 in an aqueous medium until a substantial amount of the compound is produced.

4,522,920

PRODUCTION OF ETHANOL

Conny R. Thorsson, Jarfalla, and Indrek J. Viira, Danderyd, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

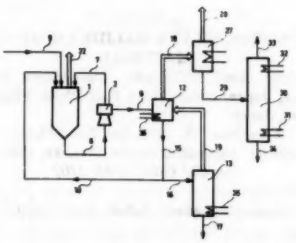
Continuation of Ser. No. 123,716, Feb. 22, 1980, Pat. No. 4,358,536. This application Aug. 16, 1982, Ser. No. 408,607

Claims priority, application Sweden, Feb. 27, 1979, 7901738

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.³ B01D *3/16;* **C07C** *29/80;* **C12P** *7/06*

U.S. Cl. 435—161 **14 Claims**

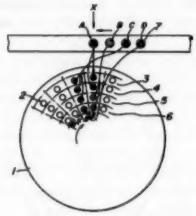


1. In the production of ethanol from a substrate containing carbohydrate, the method which comprises the continuous steps of delivering the substrate to a fermentor to provide a fermenting liquor, feeding a flow of said liquor from the fermentor to a separating unit and there separating the liquor into a yeast concentrate flow and a yeast-free flow, recirculating said yeast concentrate flow to the fermentor, feeding said yeast-free flow to a short distillation column and there separating it into a first ethanol-enriched vapor flow and a first liquid bottom flow, treating said first vapor flow to produce ethanol of a desired quality, recirculating a major part of said first liquid bottom flow to the fermentor, feeding a minor residual part of said first liquid bottom flow to a stripping unit, and separating said residual part in the stripping unit into a second ethanol-enriched vapor flow and a second liquid bottom flow, exhausted of ethanol.

4,522,921
SAMPLE DELIVERING METHOD FOR USE IN AUTOMATIC CHEMICAL ANALYSIS

Yuji Ogawa, Kamifukuoka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,077
Claims priority, application Japan, Dec. 11, 1981, 56-198357
Int. Cl.³ G01N *35/06*
U.S. Cl. 436—47 **8 Claims**



1. A sample delivering method for use in a multi-channel multi-item automatic chemical analyzer having a plurality of reaction lines comprised of reaction tubes, each line being previously set to perform given test-items, at least one sample supplying line carrying sample tubes containing successive samples to be analyzed, and a sample delivery means for delivering successive samples fed along the sample supplying line into at least one reaction tube in at least one reaction line, comprising the consecutive steps of:

setting a sample delivering region in said reaction lines and sample supplying line by selecting portions thereof to which and from which samples will be delivered;

delivering a portion of a sample into at least one reaction tube selected from the reaction tubes in said sample delivering region, which reaction tube corresponds to a test-item required for the sample;

detecting whether any vacant reaction tubes are present among the reaction tubes situated in said sample delivering region after said delivery;

moving the samples along the sample supplying line by one step to bring a new sample into said sample delivering region;

if vacant reaction tubes are detected, determining if any of them correspond to test-items required for said new sample; and,

if any do so correspond, delivering a portion of the new sample into at least one said vacant reaction tube which so corresponds.

4,522,922
SOLUBLE ASSAY

José Carro, 2850 SW. 122 Ave., Miami, Fla. 33175, and Frank de Velasco, 10945 SW. 75 Ct., Miami, Fla. 33156

Filed Apr. 16, 1982, Ser. No. 368,961
Int. Cl.³ G01N *33/50, 33/54, 33/60*
U.S. Cl. 436—500 **26 Claims**

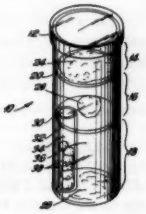
1. A process for the assay of a ligand having at least two determinant sites, comprising:

contacting in solution a sample containing said ligand with a first unsupported binder, in labeled form, which is specific for the ligand, said first binder being a member selected from the group consisting of a first antibody and a first naturally occurring binder, a second unsupported binder, which is unlabeled, and which is specific for the ligand, said second binder being a member selected from the group consisting of a second antibody and a second naturally occurring binder, said first and second antibody being raised in different animal species, and said first and second naturally occurring binders being different substances, and an unsupported soluble precipitating binder specific for said second binder, said contacting binding a portion of the first binder and at least a portion of the second binder to the ligand and precipitating a complex comprising the precipitating binder and ligand bound to both the first binder and second binder; and determining the amount of first binder in at least one of the solution and the complex as a measure of the ligand in the sample.

4,522,923
SELF-CONTAINED ASSAY METHOD AND KIT

Alice Deutsch, New York, and Herbert Platt, Great Neck, both of N.Y., assignors to Genetic Diagnostics Corporation, Great Neck, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,692
Int. Cl.³ G01N *33/52, 33/54;* B65D *71/00*
U.S. Cl. 436—536 **13 Claims**



1. A test device comprising a container, at least two water-soluble barriers subdividing said container into at least three superposed chambers, and different biologically active substances in each chamber, whereby upon introduction of an aqueous biological sample to be tested into the topmost chamber the sample will successively mix with the contents of the chambers, the contact time in each chamber being a function of the water solubility of the barriers.

10. A method of testing an aqueous biological sample for the presence therein of a particular material which comprises providing a test device according to claim 1, the biologically active substances in each chamber being so chosen that the color or absence of color in the final chamber indicates the presence or absence of the particular material in the initial sample, adding the sample to the topmost chamber, and allowing the device to stand in vertical position for a time sufficient for the color change to take place if it will.

4,522,924
IMMOBILIZED ENZYME COMPOSITE/PROCESS USING A MICA CARRIER

David L. Tennent, Lindley, N.Y., and Bhavender P. Sharma, San Mateo, Calif., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,855
Int. Cl.³ C12N *11/14*
U.S. Cl. 501—2 **4 Claims**

1. An immobilized enzyme composite comprising:

(a) an insoluble carrier comprised of:

(i) an alkali metal, water-swelling mica selected from fluorohectorite [$XMg_2LiSi_4O_{10}F_2$], hydroxyl hectorite [$XMg_2LiSi_4O_{10}(OH)_2$], boron fluorophlogopite [$XMg_3BSi_3O_{10}F_2$], hydroxyl boron phlogopite [$XMg_3BSi_3O_{10}(OH)_2$]; and

(ii) solid solutions among and between the above micas and structurally compatible species selected from talc [$Mg_3Si_4O_{10}(OH)_2$], fluorotalc [$Mg_3Si_4O_{10}F_2$], polylithonite [$XLi_2AlSi_4O_{10}(OH)_2$], fluoropolylithonite [$XLi_2AlSi_4O_{10}F_2$], phlogopite [$XMg_3AlSi_3O_{10}(OH)_2$], and fluorophlogopite [$XMg_3AlSi_3O_{10}F_2$];

wherein X represents an alkali metal interlayer cation;

(b) an enzyme which is bound in the insoluble carrier.

4. The process of immobilizing an enzyme comprising:
(a) selecting an insoluble carrier material comprised of:
(i) an alkali metal, water-swelling mica selected from fluorohectorite [$XMg_2LiSi_4O_{10}F_2$], hydroxyl hectorite [$XMg_2LiSi_4O_{10}(OH)_2$], boron fluorophlogopite [$XMg_3BSi_3O_{10}F_2$], hydroxyl boron phlogopite [$XMg_3BSi_3O_{10}(OH)_2$]; and
(ii) solid solutions among and between the above micas and structurally compatible species selected from talc [$Mg_3Si_4O_{10}(OH)_2$], fluorotalc [$Mg_3Si_4O_{10}F_2$], polylithonite [$XLi_2AlSi_4O_{10}(OH)_2$], fluoropolylithonite [$XLi_2AlSi_4O_{10}F_2$], phlogopite [$XMg_3AlSi_3O_{10}(OH)_2$], and fluorophlogopite [$XMg_3AlSi_3O_{10}F_2$];
wherein X represents an alkali metal interlayer cation;
(b) forming an aqueous slurry of the carrier material;
(c) dewatering the slurry sufficient to form a pliable mass of carrier material;
(d) contacting an enzyme with the carrier; and
(e) molding the pliable mass into a desired shape;
(f) drying the molded, pliable mass so as to fix the shape, thereby immobilizing the enzyme on an insoluble carrier.

4,522,925
SEALING GLASS AND METHOD OF MAKING A WILLEMITE FILLER THEREFOR

Perry P. Pirooz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 1, 1983, Ser. No. 528,385
Int. Cl.³ C03C *3/08, 3/10*
U.S. Cl. 501—15 **1 Claim**

1. A sealing glass composition consisting essentially of about 65 parts by weight of a lead borate glass matrix and 35 parts by weight of a Willemite (zinc orthosilicate) filler, the Willemite (zinc orthosilicate) being made by mixing about 73 parts by weight of ZnO and about 27 parts by weight of SiO_2 and firing the mixture at about 1350° C. for about 24 hours and milling the product to provide finely divided Willemite (zinc orthosilicate) with a particle size comprising about 85% finer than 38 microns, the lead borate glass having the following ingredients in approximate weight percents:

Ingredients	Wt. %
PbO	83
B_2O_3	12.5
Bi_2O_3	3
SiO_2	0.5
ZnO	0.5
BaO	0.5

4,522,926
ALUMINUM RESISTANT REFRACTORY COMPOSITION

Frank T. Felice, Norristown, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

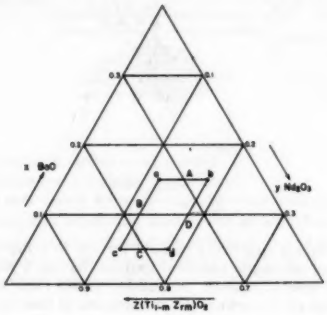
Filed Mar. 10, 1983, Ser. No. 474,083
Int. Cl.³ C04C *35/10, 35/04, 35/12, 35/14*
U.S. Cl. 501—127 **6 Claims**

1. A refractory composition resistant to attack by molten aluminum alloys consisting essentially of:
a. 45 to 90 weight percent refractory aggregate particles compatible with the selected refractory binder,
b. 3 to 40 weight percent refractory binder selected from the group consisting of calcium aluminate cement, aluminum phosphate, phosphoric acid, alkali silicates and clay, and
c. an additive consisting essentially of crystalline $9Al_2O_3.2B_2O_3$ such that the refractory composition contains 1 to 12 percent $9Al_2O_3.2B_2O_3$ by weight.

4,522,927
DIELECTRIC CERAMIC COMPOSITION

Masao Kashima, and Noboru Tomuro, both of Yokoze, Japan, assignors to Mitsubishi Mining and Cement Company Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 451,929, Dec. 21, 1982, abandoned. This application Oct. 26, 1983, Ser. No. 545,523
Claims priority, application Japan, Aug. 13, 1982, 57-139696
Int. Cl.³ C04B *35/49*
U.S. Cl. 501—139 **2 Claims**



1. A dielectric ceramic composition having a composition represented by the formula

$$xBaO-yNd_2O_3-z(Ti_{1-m}Zr_m)O_2$$

wherein $x+y+z=1.00$, m is between 0.05 and 0.25, and x, y, and z are in the molar ratio region surrounded by the points a, b, c, and d which are represented by the following x-y-z coordinates:

	x	y	z
a	0.15	0.12	0.73
b	0.15	0.18	0.67
c	0.05	0.18	0.77
d	0.05	0.12	0.83

said composition being free of bismuth.

4,522,928
REMOVAL OF METAL COMTAMINANTS FROM CATALYSTS USING BUFFERED OXALIC ACID

Gary B. McVicker; James L. Carter, both of Westfield; Lawrence L. Murrell, S. Plainfield, and John J. Ziemiak, Annandale, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 434,730, Oct. 18, 1982, abandoned. This application May 14, 1984, Ser. No. 610,096
Int. Cl.³ B01J *23/96, 23/94, 23/92*
U.S. Cl. 502—26 **19 Claims**

1. A process for removing metal contaminants from a hydroconversion catalyst containing at least one metal from Groups VIB, VIIB or VIII supported on a refractory inorganic oxide which is susceptible to acid attack which process comprises contacting the contaminated catalyst at a temperature from about 0° C. to 100° C. with a buffered oxalic acid solution having a pH from about 3 to about 10, wherein the oxalic acid concentration is from about 0.0001M to 5M.

11. The process of claim 1 wherein the buffered oxalic acid solution is a mixture of oxalic acid in an aqueous/non-aqueous solvent system.

13. The process of claim 1 wherein the metal contaminant is one or more metals selected from the group consisting of iron,

vanadium, nickel, sodium, magnesium, chromium, copper, strontium, lithium, and lead.

4,522,929

ACTIVE ZEOLITE CATALYSTS OF IMPROVED STABILITY

Arthur W. Chester, and Yung F. Chu, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 346,440, Feb. 8, 1982, Pat. No. 4,429,176. This application Oct. 6, 1983, Ser. No. 539,497

Int. Cl.³ B01J *29/28, 37/10*

U.S. Cl. 502—77 **16 Claims**

1. A method of producing a zeolite catalyst of improved stability wherein said zeolite catalyst comprises a zeolite having a silica/alumina ratio greater than 12 and a constraint index of 1 to 12, comprising steaming said zeolite catalyst in its fresh state under controlled conditions of temperature, time and steam partial pressure so as to initially increase the α-activity of said catalyst and produce a steamed catalyst having a peak α-activity, and subsequently reduce the α-activity from said peak α-activity to an α-activity substantially the same as the α-activity of said fresh catalyst and no more than 25% below the initial α-activity of said fresh catalyst, said steamed catalyst having enhanced stability over said fresh catalyst.

2. A method according to claim 1 wherein said zeolite is ZSM-5.

3. A method according to claim 1 wherein said catalyst further comprises metal promoters.

4,522,930

COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Enrico Albizzati, Arona; Sandro Parodi, Oleggio, and Pier C. Barbe, Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy and Mitsui Petrochemical Ind., Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,594

Claims priority, application Italy, Feb. 12, 1982, 19624 A/82

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—124 **3 Claims**

1. Catalysts for the polymerization of alpha-olefins comprising the product of the reaction of:

(a) an organometallic Al compound;

(b) an electron-donor compound reactive, under standard conditions, with $MgCl_2$ but not completely complexed with Al-triethyl; and

(c) a solid component comprising a titanium compound having at least a Ti-halogen bond and an electron-donor compound both supported on an anhydrous Mg dihalide, the electron-donor compound being selected from the group consisting of electron-donor compounds containing N, P and/or S atoms, ethers, ketones, lactones and the following classes of esters:

(1) hydrocarbyl esters of linear saturated dicarboxylic acids having from 2 to 5 carbon atoms;

(2) esters of unsaturated polycarboxylic acids in which two carboxyl groups are linked to vicinal, double bond-forming carbon atoms and in which the hydrocarbyl radical or radicals of the COOR groups are linear saturated or unsaturated radicals or cycloaliphatic radicals with 1–20 carbon atoms or hydrocarbyl esters of unsaturated linear or branched polycarboxylic acids with 1–20 carbon atoms in which the carboxy groups are not linked to vicinal double bond-forming carbon atoms;

(3) hydrocarbyl esters of aromatic meta- and para-dicarboxylic acids and hydrocarbyl esters of polycarboxylic aromatic acids containing more than two carboxyl groups;

(4) hydrocarbyl esters of aromatic hydroxy compounds containing the OH groups in meta- or para-position, and esters of aromatic hydroxy acids the OH groups of which are in meta- or para-position with respect to the carboxyl group;

(5) esters RCOOR′ in which the hydrocarbyl groups R and R′, which can be the same or different, are linear saturated or unsaturated radicals or cycloaliphatic radicals having from 1 to 20 carbon atoms, or R is an aryl, alkylaryl or cycloalkyl with 5–20 carbon atoms and R′ is a hydrocarbyl radical or a heterocyclic ring with 5–7 atoms in the ring;

(6) hydrocarbyl esters of polycarboxylic acids in which at least one carboxyl group is linked to an aromatic ring and at least one other is linked to a carbon atom of an aliphatic chain or to a cycloaliphatic ring or at least two carbonyl groups are linked to an aromatic ring through an alkylene group;

(7) esters of aromatic polycarboxylic acids containing at least two non-condensed aromatic rings, each bearing a carboxyl group;

(8) esters of carbonic acid with glycols, and carbonic acid derivatives of formula RO—CO—OR′ wherein R and R′ are the same or different acyl group with 1–20 carbon atoms;

(9) esters of polyols and of monohydroxy-phenols; and

(10) hydrocarbyl esters of acetylenic acids; the electron-donor compound being extractable from the solid for at least 70% by mols with Al-triethyl in standard measurement conditions, and the surface area of the solid subjected to extraction being higher than 20 m^2/g.

3. Catalysts according to claim 1, in which component (b) is selected from the group consisting of silicon compounds containing at least one Si—OR or Si—OCOR or Si—NR_2 bond in which R is an alkyl, alkenyl, aryl, arylalkyl or cycloalkyl radical containing from 1 to 20 carbon atoms.

4,522,931

METHOD FOR THE PREPARATION OF SUPPORTED CATALYSTS AND SUPPORTED CATALYSTS THUS OBTAINED

Giuseppe Gubitosa; Antonio Berton; Nicola Pernicone, all of Novara, and Graziano Vidotto, Padua, all of Italy, assignors to Montepolimeri S.p.A, Milan, Italy

Filed Sep. 9, 1983, Ser. No. 530,755

Claims priority, application Italy, Sep. 10, 1982, 23197 A/82

Int. Cl.³ B01J *21/18, 31/02*

U.S. Cl. 502—150 **7 Claims**

5. A method of preparing a supported catalyst for the hydrogenation of nitro-aromatic compounds, according to which method Pd is deposited on the outer surface of a carrier consisting of an adsorbent carbon, wherein:

(a) said carbon, containing an amount of ash lower than 0.6% b.w., is suspended in water;

(b) a liquid hydrocarbon, immiscible with water and selected from the group consisting of n-hexane, n-heptane, benzene and toluene, is added to the suspension obtained according to (a), the volume of said hydrocarbon being substantially equal to or lower than the volume of the pores of the carrier;

(c) the pH of the suspension obtained according to (b) is brought to a level between 7 and 8.5;

(d) an aqueous solution, containing a soluble compound of Pd, is brought into contact with the suspension obtained according to (c), while keeping the pH constant within said 7–8.5 range, and the pH is then raised to a level equal to or higher than 12, according to known techniques; and

(e) the thus obtained solid catalyst is recovered from the mother liquor by a conventional procedure.

6. A supported catalyst, prepared according to claim 5, containing from 0.1 to 5% b.w. of Pd, wherein Pd is distributed on the outer surface of a granule of low-ash carbon, the inner core of the granule being substantially void of Pd.

7. A catalyst according to claim 6, containing a liquid phase, consisting substantially of water and of said immiscible liquid hydrocarbon, the amount of liquid phase being at least 20% of the whole weight of the supported catalyst.

4,522,932

PHOSPHINE AND PHOSPHONIUM COMPOUNDS AND CATALYSTS

Howard L. Mitchell, III, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 423,652, Sep. 27, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 603,141

Int. Cl.[3] B01J *31/12, 31/24*

U.S. Cl. 502—153 2 Claims

1. A reaction product catalyst mixture comprising cobalt metal, ligand, in the presence of H_2 and CO at a temperature and pressure sufficient to obtain a catalyst capable of catalyzing a hydrocarbonylation reaction, wherein said ligand comprises a compound of the formula $R_{3-b}L\$_b$ wherein L is selected from the group consisting of trivalent P and As; each R is independently selected from the group consisting of alkyl, alkynyl, aryl, alkoxyalkyl, aryloxyalkyl, alkoxyaryl, aryloxyaryl, and ferrocenyl and fluoro groups, wherein the aryl portions thereof can be substituted with a halogen and the alkyl portions thereof can be substituted with a member selected from halogen and hydroxy groups, with the proviso that said halogens on said alkyl groups are not in an alpha-position with respect to said L atom unless they are fluoro atoms and with the further proviso that at least one R group on said L atom is a fluoro group; each \$ group is $—C{\equiv}CR^1$, wherein R^1 is selected from the group consisting of R, L^+R_3, wherein R is defined as above and b is an integer of from 1 to 3.

4,522,933

HYDROFORMYLATION CATALYST CONTAINING BISPHOSPHINE MONOOXIDE LIGANDS

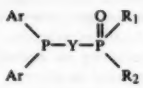
Anthony G. Abatjoglou, and Ernst Billig, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 293,190, Aug. 17, 1981, Pat. No. 4,400,548. This application Mar. 17, 1983, Ser. No. 476,314

Int. Cl.[3] B01J *31/24*

U.S. Cl. 502—161 7 Claims

1. A rhodium complex hydroformylation catalytic precursor composition consisting essentially of a solubilized rhodium carbonyl bisphosphine monooxide acetylacetonate complex, an organic solvent and free bisphosphine monooxide ligand; wherein the bisphosphine monooxide of said complex and said free bisphosphine monooxide ligand is an organic tertiary bisphosphine monooxide ligand having the general formula



wherein each Ar group represents an identical or different substituted or unsubstituted aryl radical, each R_1 and R_2 group represents an identical or different substituted or unsubstituted monovalent hydrocarbon radical and Y represents a divalent bridging group.

4,522,934

VANADOTUNGSTOMOLYBDOPHOSPHORIC ACID OXIDATION CATALYST

Wilfred P. Shum, East Windsor; John F. White, Princeton, both of N.J., and Eva M. Beals, Washington Crossing, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 258,102, Apr. 27, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,810

Int. Cl.[3] B01J *27/14;* C07B *3/00*

U.S. Cl. 502—209 4 Claims

1. A method of preparing a three transition metal, Keggin structure heteropoly acid catalyst comprising the steps of:

(a) providing a heteropolyacid Keggin defect structure of the formula: $Na_3H_6PMo_9O_{34}$ and

(b) introducing into said defect structure transition metal oxides of vanadium and tungsten to produce a heteropolyacid product containing molybdenum, vanadium and tungsten metals in a Keggin structure.

4,522,935

PLATINUM AND INDIUM-CONTAINING CATALYST FOR REFORMING HYDROCARBONS

Delmar W. Robinson, Palatine; Russell W. Johnson, Villa Park, and Mark D. Moser, Hoffman Estates, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 500,520, Jun. 2, 1983, Pat. No. 4,487,848. This application Oct. 7, 1983, Ser. No. 539,880

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.[3] B01J *27/04, 27/08, 27/10*

U.S. Cl. 502—223 12 Claims

1. A catalyst composition comprising a platinum group component, a tin component, an indium component and a halogen component with a porous support material, wherein the atomic ratio of indium to platinum group component is more than about 1.35.

6. The catalyst of claim 1 which also comprises, on an elemental basis, about 0.01 to 10 wt. % sulfur.

4,522,936

METATHESIS CATALYST

Simon G. Kukes, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 477,466, Mar. 21, 1983, Pat. No. 4,465,890. This application May 18, 1984, Ser. No. 611,785

Int. Cl.[3] B01J *23/24, 23/18*

U.S. Cl. 502—249 36 Claims

1. A composition comprising:

(a) an oxide selected from the group consisting of tungsten oxide, molybdenum oxide and a mixture thereof,

(b) a support, and

(c) an element selected from the group consisting of tungsten, silicon, antimony and any mixture of 2 or more thereof when (a) is tungsten oxide or a mixture of tungsten oxide and molybdenum oxide or an element selected from the group consisting of tungsten, silicon, a mixture of tungsten and silicon, a mixture of antimony and tungsten, a mixture of antimony and silicon and a mixture of antimony, tungsten and silicon when (a) is molybdenum oxide;

wherein (a) is supported by (b).

3. A composition according to claim 1 wherein said support comprises alumina.

4. A composition according to claim 1 wherein said support comprises silica.

27. The composition produced in accordance with a method comprising

(i) mulling together anhydrous tungstic acid and silica gel to produce a mixture,

(ii) heating said mixture to drive off water,

(iii) treating said mixture with an element selected from the group consisting of tungsten, silicon, antimony, and mixtures of any two or more thereof, and

(iv) activating said treated mixture by heating in an inert gas at a temperature of at least about 400° C.

4,522,937

PREPARATIVE PROCESS FOR ALKALINE EARTH METAL, ALUMINUM-CONTAINING SPINELS

Jin S. Yoo, Flossmoor; John A. Karch, Homewood; Richard F. Poss, Flossmoor, all of Ill., and Emmett H. Burk, Jr., Mountain Home, Ark., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 445,305, Nov. 29, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,238

Int. Cl.[3] B01J *21/04, 23/02, 23/10*

U.S. Cl. 502—302 21 Claims

1. A process for the production of an alkaline earth metal, aluminum-containing spinel composition comprising:

(a) combining (a) an acidic aqueous solution containing at least one alkaline earth metal component and (b) a basic aqueous solution containing at least one aluminum component in which the aluminum is present as an anion into an aqueous medium to form a combined mass including a liquid phase and an alkaline earth metal, aluminum-containing precipitate, provided that at least one of the acidic solution and the basic solution includes at least one additional metal component in an amount sufficient so that said alkaline earth metal, aluminum-containing spinel composition includes at least one additional metal component in an amount effective to promote the oxidation of SO_2 to SO_3 at SO_2 oxidation conditions, and further provided that the pH of said liquid phase during said combining is maintained in the range of about 7.0 to about 10.5;

and

(b) calcining said precipitate to form said alkaline earth metal, aluminum-containing spinel composition.

4,522,938

PROCESS FOR PREPARING A CATALYST

Arend Hoek; Johannes K. Minderhoud, and Martin F. M. Post, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 22, 1983, Ser. No. 554,482

Claims priority, application Netherlands, Nov. 22, 1982, 8204527

Int. Cl.[3] B01J *21/04, 23/06, 23/26, 23/72*

U.S. Cl. 502—307 8 Claims

1. A process for the preparation of a catalyst, which comprises dispersing in water a co-precipitate A comprising zinc as well as chromium and/or aluminum in such quantities that the Zn/(Cr+Al) atomic ratio is 0.25–4 and a co-precipitate B comprising copper as well as zinc and, if desired, chromium and/or aluminum in such quantities that the Cu/Zn atomic ratio is lower than 10 and the (Cr+Al)/(Cu+Zn) atomic ratio is lower than 2, and in such quantities that in the water dispersion the atomic ratio of the sum of the metals coming from co-precipitate A to the sum of the metals coming from co-precipitate B is 0.25–3 and the Cu/(Cu+Zn+Cr+Al) atomic ratio is more than 0.1, followed by spray drying the dispersion thus obtained, and then calcining the spray dried material.

4,522,939

PREPARATION OF CATALYST FOR PRODUCING MIDDLE DISTILLATES FROM SYNGAS

Johannes K. Minderhoud, and Martin F. M. Post, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 29, 1984, Ser. No. 594,618

Claims priority, application Netherlands, May 31, 1983, 8301922

Int. Cl.[3] B01J *21/04, 21/06, 21/08, 23/86*

U.S. Cl. 502—242 17 Claims

1. A process for the preparation of a catalyst by kneading and/or impregnation, which catalyst comprises 3–60 pbw cobalt and 0.1–100 pbw of at least one other metal chosen from zirconium, titanium or chromium per 100 pbw of a carrier chosen from silica, alumina or silica-alumina, characterized in that said catalyst has such L and S as to satisfy the relation $(3+4R)>(L/S)>(0.3+0.4R)$, wherein

L=the total quantity of cobalt present on the catalyst, expressed as mg Co/ml catalyst;

S=the surface area of the catalyst, expressed as m^2/ml catalyst; and

R=the weight ratio of the quantity of cobalt deposited on the catalyst by kneading to the total quantity of cobalt present on the catalyst or R=0 when catalyst prepared by impregnation.

4,522,940

METHOD OF PREPARING A CATALYST AND CATALYST PREPARED BY THE METHOD

Rodney M. Sambrook, Sheffield, and Julian R. H. Ross, Cleckheaton, both of England, assignors to Dyson Refractories Limited, United Kingdom

Filed Jul. 16, 1981, Ser. No. 283,792

Claims priority, application United Kingdom, Jul. 16, 1980, 8023225

Int. Cl.[3] B01J *21/04, 23/78*

U.S. Cl. 502—328 19 Claims

1. A method of making a catalyst having a catalytically active component located within the pores of a preformed low surface area ceramic matrix, comprising the steps of:

impregnating the pores of the matrix with a catalyst precursor solution including salts of at least one catalytically active metal component and a hydrolysable material;

removing excess solution from the matrix while maintaining solution within the pores;

heating the matrix to a temperature suitable for controlled hydrolysis of the hydrolysable material, said controlled hydrolysis serving to increase the pH of the solution within the pores so as to precipitate said at least one catalytically active component substantially exclusively within the pores of the matrix; and

calcining the matrix to produce the catalyst.

4,522,941

METHOD OF CONTROLLING THE DISTRIBUTION OF A COATING MATERIAL UPON THE SURFACE OF A SUPPORT

Michael S. Heise, Bath, N.Y.; Christopher S. Tucker, Strafford, Pa., and James A. Schwarz, Fayetteville, N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,927

Int. Cl.[3] B01J *21/04, 23/42, 23/44*

U.S. Cl. 502—333 2 Claims

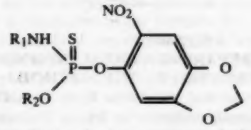
1. A method of controlling the distributing of a coating material upon the surface of a support that comprises the steps of providing an alumina support that assumes a surface charge by means of protonation-deprotonation processes when placed in an aqueous solution, placing said support in an aqueous solution containing primary adsorbable coating ions of platinum having a charge opposite the charge assumed by the support whereby the platinum ions are adsorbed onto the alumina support surface, the concentration of said platinum ions in the solution being able to satisfy the adsoprtion sites on the surface of the support, said solution further containing two soluble, non-adsorbable, control ingredients for regulating the coating process that includes sodium nitrate for adjusting the resistence of the double layer existing at the support surface to the adsorption of platinum ions onto the surface and hydrochloric acid for adjusting the charge on the support surface, and adjusting the concentration of the sodium nitrate and hydrochloric acid in the solution to generate a coating having a desired distribution of platinum upon the surface of the support.

4,522,942
PHOSPHORAMIDOTHIONATES

Hideo Kohsaka, Hyogo; Sasaki Mitsuru, Osaka, and Yukio Ishiguri, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

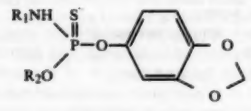
Filed Jun. 2, 1983, Ser. No. 500,435
Claims priority, application Japan, Jun. 3, 1982, 57-95764; Nov. 2, 1982, 57-192841; Nov. 5, 1982, 57-195035
Int. Cl.³ A01N *57/32;* C07F *9/24*
U.S. Cl. 514—95 24 Claims

1. A phosphoramidothionate of the formula:



wherein R_1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a lower cycloalkyl group, a lower cycloalkyl(lower)alkyl group, a halo(lower)alkyl group, a lower alkoxy(lower)alkyl group, a di(lower)alkoxy(lower)alkyl group, a cyano(lower)alkyl group, a lower alkylthio(lower)alkyl group, a lower alkynylthio(lower)alkyl group, a lower dioxothiacycloalkyl group, a lower thiacycloalkyl group, a lower oxacycloalkyl group, a lower oxacycloalkyl(lower)alkyl group or a thienyl(lower)alkyl group and R_2 is a lower alkyl group.

14. A phosphoramidothionate of the formula:



wherein R_1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a lower cycloalkyl group, a lower cycloalkyl(lower)alkyl group, a halo(lower)alkyl group, a lower alkoxy(lower)alkyl group, a di(lower)alkoxy(lower)alkyl group, a cyano(lower)alkyl group, a lower alkylthio(lower)alkyl group, a lower alkynylthio(lower)alkyl group, a lower dioxothiacycloalkyl group, a lower thiacycloalkyl group, a lower oxacycloalkyl group, a lower oxacycloalkyl(lower)alkyl group or a thienyl(lower)alkyl group and R_2 is a lower alkyl group.

23. A method for controlling fungi which comprises applying a fungicidally effective amount of the phosphoramidothionate according to claim 1 to phytopathogenic fungi.

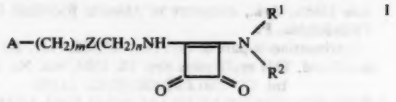
24. A method for controlling fungi which comprises applying a fungicidally effective amount of the phosphoramidothionate according to claim 14 to phytopathogenic fungi.

4,522,943
CHEMICAL COMPOUNDS

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

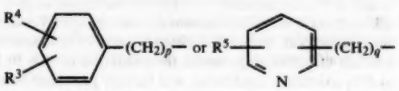
Continuation-in-part of Ser. No. 264,533, May 18, 1981, Pat. No. 4,390,701. This application Apr. 21, 1982, Ser. No. 369,971
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.³ C07D *211/06, 295/10;* A61K *31/445, 31/55*
U.S. Cl. 514—183 18 Claims

1. A compound of the formula



I

wherein R^1 and R^2 each are independently hydrogen or (lower)alkyl, and, when R^1 is hydrogen, R^2 may also be allyl, propargyl, cyclo(lower)alkyl(lower)alkyl, cyclo(lower)alkyl, cyano(lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, hydroxy, 2,3-dihydroxypropyl,



in which:

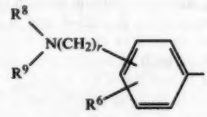
p is an integer of from 1 to 6 inclusive, q is an integer of from 1 to 6 inclusive, R^3 and R^4 each are independently hydrogen, (lower)alkyl having 1 or 2 carbon atoms, hydroxy, (lower)alkoxy having 1 or 2 carbon atoms or halogen, and, when R^3 is hydrogen, R^4 also may be trifluoromethyl, or R^3 and R^4, taken together, may be methylenedioxy, R^5 is hydrogen, (lower)alkyl, (lower)alkoxy, hydroxy, amino or halogen,

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is sulfur, oxygen or methylene; and

A is



in which

R^6 is hydrogen, (lower)alkyl, (lower)alkoxy or halogen;

r is an integer of from 1 to 4 inclusive; and

R^8 and R^9 each are independently hydrogen, (lower)alkyl, allyl, propargyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, cyclo(lower)alkyl, or phenyl(lower)alkyl, provided that R^8 and R^9 may not both be cyclo(lower)alkyl, or R^8 and R^9, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, piperidino, methylpiperidino, dimethylpiperidino, hydroxypiperidino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino or 3-azabicyclo[3.2.2]nonane;

with the proviso that, when $R^1$and R^2 are both hydrogen, $A—(CH_2)_mZ(CH_2)_n—$ may not be the 3-(3-piperidinomethylphenoxy)propyl moiety;

or a nontoxic, pharmaceutically acceptable salt, hydrate or solvate thereof.

4,522,944

CARBOXAMIDO-DERIVATIVES OF 5H-1,3,4-THIADIAZOLO[3,2-a]PYRIMIDINES, COMPOSITIONS AND USE

Gianfederico Doria, via L. Pasteur 16, Milan; Carlo Passarotti, via Fiume 2, Gallarate (Varese), and Ada Buttinoni, via Monte Suello 18, Milan, all of Italy

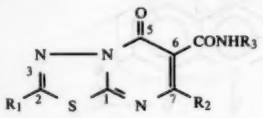
Filed Dec. 8, 1983, Ser. No. 559,322

Claims priority, application United Kingdom, Dec. 23, 1982, 8236642; Nov. 8, 1983, 8329746

Int. Cl.[3] A61K *31/505, 31/535;* C07D *513/04*

U.S. Cl. 514—222 7 Claims

1. A compound of general formula (I)



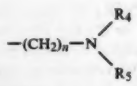
(I)

wherein

R_1 represents:

(a) a hydrogen or halogen atom or a C_1–C_6 alkyl group unsubstituted or substituted by C_1–C_6 alkoxy;

(b) a



group, wherein n is zero, 1, 2 or 3 and each of R_4 and R_5 is, independently, hydrogen or C_1–C_6 alkyl, or R_4 and R_5, taken together with the nitrogen atom to which they are linked, form an unsubstituted N-pyrrolidinyl ring or a piperidino, morpholino, N-piperazinyl or

ring, wherein m is zero, 1 or 2, the piperidino and morpholino rings are unsubstituted or substituted by one or two C_1–C_6 alkyl groups and the N-piperazinyl ring is unsubstituted or substituted by a substituent chosen from C_1–C_6 alkyl, phenyl and pyridyl;

(c) trihalomethyl or a R_6-$S(O)_p$— group, wherein p is zero, 1 or 2 and R_6 is C_1–C_6 alkyl or benzyl, wherein the phenyl ring is unsubstituted or substituted by a substituent chosen from halogen, C_1–C_6 alkyl and C_1–C_6 alkoxy; or

(d) an unsubstituted pyridyl, pyridyl-N-oxide or thienyl ring or a phenyl ring unsubstituted or substituted by one, two or three substituents independently chosen from halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, hydroxy, formyloxy, C_2–C_8 alkanoyloxy, nitro, amino, formylamino, C_2–C_8 alkanoylamino and di-(C_1–C_6)alkyl-amino;

R_2 represents a hydrogen atom or a C_1–C_6 alkyl group;

R_3 represents:

(a') a phenyl ring, unsubstituted or substituted by one or two substituents independently chosen from C_1–C_6 alkyl, C_1–C_6 alkoxy and halogen;

(b') an unsaturated heteromonocyclic or heterobicyclic ring, containing one or more heteroatoms chosen from nitrogen and sulphur, unsubstituted or substituted by one or two substituents independently chosen from halogen, C_1–C_6 alkyl and C_1–C_6 alkoxy; and the pharmaceutically acceptable salts thereof.

6. A method of treatment in a human patient of inflammatory processes and pains, said method comprising administering an effective amount of a compound of claim 1.

4,522,945

(PIPERIDINYLALKYL) QUINAZOLINE DERIVATIVES

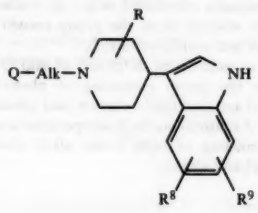
Jan Vandenberk, Beerse; Ludo Kennis; Marcel Van der Aa, both of Vosselaar, and Albert Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 84,272, Oct. 12, 1979, Pat. No. 4,335,127, which is a continuation-in-part of Ser. No. 1,493, Jan. 8, 1979, abandoned. This application Mar. 26, 1982, Ser. No. 362,214

Int. Cl.[3] A61K *31/505;* C07D *401/14*

U.S. Cl. 514—259 6 Claims

1. A chemical compound selected from the group consisting of a compound having the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein

R is a member selected from the group consisting of hydrogen, hydroxy and lower alkyl;

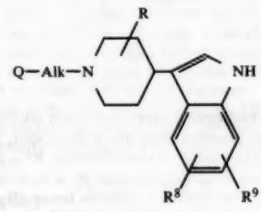
Alk is an alkylene chain having from 1 to 4 carbon atoms;

R^8 and R^9 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy, trifluoromethyl and amino; and

Q is quinazolinyl, the 1-, 2-, 3- or 4-position of which is connected with the alkylene side chain, said quinazolinyl bearing in one or both of its 2- and 4-positions a oxo or thioxo group, wherein the benzene ring of said quinazolinyl is optionally substituted with 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl, nitro and cyano, and wherein the pyrimidino ring of said quinazolinyl may be partly or fully saturated, said pyrimidino ring being optionally substituted with 1 to 3 substituents independently selected from the group consisting of lower alkyl, aryl and aryl(lower alkyl);

wherein said aryl as used in the definition of said Q is a member selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, wherein said substituted phenyl has from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and amino.

6. A method of treating congestion in warm-blooded animals which comprises the administration thereto of an effective anti-congestive amount of a chemical compound selected from the group consisting of a compound having the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein

R is a member selected from the group consisting of hydrogen, hydroxy and lower alkyl;

Alk is an alkylene chain having from 1 to 4 carbon atoms;

R^8 and R^9 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy, trifluoromethyl and amino; and

Q is quinazolinyl, the 1-, 2-, 3- or 4-position of which is connected with the alkylene side chain, said quinazolinyl bearing in one or both of its 2- and 4-positions a oxo or thioxo group, wherein the benzene ring of said quinazolinyl is optionally substituted with 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl, nitro and cyano, and wherein the pyrimidino ring of said quinazolinyl may be partly or fully saturated, said pyrimidino ring being optionally substituted with 1 to 3 substituents independently selected from the group consisting of lower alkyl, aryl and aryl(lower alkyl);

wherein aryl as used in the definition of said Q is a member selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, wherein said substituted phenyl has from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and amino.

4,522,946

DIOXY HEXAHYDROBENZO[6,7]CYCLOHEPTA[1,2,3-de]ISOQUINOLINE DERIVATIVES USEFUL AS NEUROLEPTIC AGENTS

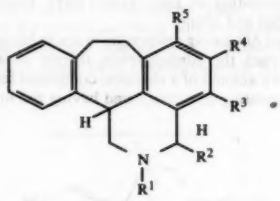
André A. Asselin, St. Laurent, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Filed Jun. 13, 1983, Ser. No. 504,014

Int. Cl.³ A61K *31/435;* C07D *221/18*

U.S. Cl. 514—284 **20 Claims**

1. A compound of formula I



(I)

in which R^1 is hydrogen, lower alkyl, lower alkenyl, hydroxy(lower)alkyl or phenylmethyl; R^2 is hydrogen, lower alkyl, lower cycloalkyl, phenyl or phenylmethyl; R^4 is lower alkoxy or hydroxy; and R^3 is hydroxy and R^5 is hydrogen, or R^3 is hydrogen and R^5 is hydroxy; wherein lower alkyl and lower alkenyl are straight chain alkyl radicals having from 1 to 6 carbon atoms and branched chain alkyl radicals having up to 4 carbon atoms and lower cycloalkyl are cyclic alkyl radicals having 3 to 6 carbon atoms or a therapeutically acceptable acid addition salt thereof.

4,522,947

CERTAIN 1,3-OXAZOLO[4,5H]QUINOLINES USEFUL AS ANTI-ALLERGY AGENTS

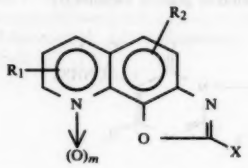
John H. Musser, Malvern, Pa., and Richard E. Brown, East Hanover, N.J., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 362,712, Mar. 29, 1982, abandoned. This application Mar. 18, 1983, Ser. No. 476,673

Int. Cl.³ C07D *498/04;* A61K *31/47*

U.S. Cl. 514—293 **9 Claims**

1. A quinoline compound of the formula



and pharmaceutically acceptable salts thereof, wherein

R_1 and R_2 are both hydrogen, or one of R_1 and R_2 is hydrogen and the other is C_1–C_5 alkyl, halo, trifluoromethyl, nitro, C_1–C_5-aklylamino, or benzyl;

m is 0 or 1; and

X is cyano, formyloximino, or $COOR_4$ in which the R_4 group is hydrogen, C_1–C_{12} alkyl or C_1–C_{12} alkyl substituted by a C_1–C_5 alkoxy, diethylamino or amino group.

9. A method of treating asthma which comprises administering to a patient requiring treatment an effective amount of a compound or salt according to claim 1.

4,522,948

SPERMICIDAL SUBSTITUTED 1-(CYCLOALKYL)ALKYLIMIDAZOLES

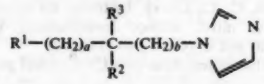
Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 24, 1981, Ser. No. 256,877

Int. Cl.³ A61K *31/415;* C07D *233/58*

U.S. Cl. 514—396 **7 Claims**

1. A compound of the formula



(I)

wherein:

R^1 is cycloalkyl of five to seven carbon atoms optionally substituted by one or more lower alkyl groups;

R^2 is cycloalkyl of five to seven carbon atoms, or cycloalkylalkyl of six to ten carbon atoms wherein when a cycloalkyl is cyclohexyl, it is optionally substituted by one or more lower alkyl groups;

R^3 is hydrogen or methyl;

a is 0, 1, 2 or 3; and

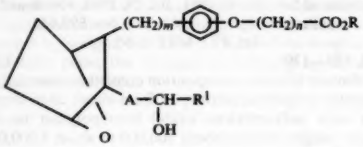
b is 1, 2 or 3, or a pharmaceutically acceptable acid addition salt thereof.

4,522,949
7-OXABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN INTERPHENYLENE ANALOGS USEFUL AS CARDIOVASCULAR AGENTS

Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 20, 1983, Ser. No. 543,681
Int. Cl.³ A61K *31/34*; C07D *307/00*
U.S. Cl. 514—469 **12 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;
wherein
A is CH=CH or $(CH_2)_2$;
m is 1 to 4; n is 1 to 8; R is H, lower alkyl or alkali metal; and R^1 is lower alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; wherein the term lower alkyl or alkyl by itself or as part of another group is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;
the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy; and
the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and wherein $(CH_2)_m$ and $(CH_2)_n$ may be substituted by one or more alkyl substituents.

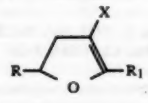
8. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,522,950
2,3-DIHYDROFURANS USEFUL AS FUNGICIDES

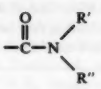
Allen L. Hall, Amelia, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,975
Int. Cl.³ A01N *43/08*; C07D *307/30, 307/32*
U.S. Cl. 514—471 **4 Claims**

1. 4-Diethylcarbamyl-5-methyl-2-vinyl-2,3-dihydrofuran.
2. 4-Phenylcarbamyl-5-methyl-2-vinyl-2,3-dihydrofuran.
3. 4-Phenylsulfonyl-5-methyl-2-vinyl-2,3-dihydrofuran.
4. A method of inhibiting the growth of fungi which comprises contacting said fungi with a fungicidally effective amount of a compound of the formula



wherein R is an ethyl or vinyl group, R_1 is a C_{1-4} alkyl group and X is selected from the group consisting of nitrile;



and R′ is C_{1-4} alkyl or phenyl and R″ is hydrogen, C_{1-4} alkyl or phenyl; and

where R‴ is C_{1-10} alkyl, phenyl, benzyl, C_{1-4} alkyl- or alkoxyl-substituted phenyl or benzyl or the group

where R′ is C_{1-4} alkyl or phenyl and R″ is hydrogen, C_{1-4} alkyl or phenyl.

4,522,951
REMOVAL OF MG^{++} AND CA^{++} IONS FROM NaCl BRINE

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 307,827, Oct. 2, 1981, Pat. No. 4,405,574. This application Sep. 19, 1983, Ser. No. 533,682
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ C08D *5/20*; G01N *31/04*
U.S. Cl. 521—28 **19 Claims**

1. A method for substantially removing alkaline earth metal ions from a NaCl brine feed to an electrolytic cell wherein NaCl is electrolyzed to produce chlorine and sodium hydroxide, said method comprising
passing said NaCl brine through a vessel containing a particulate, macroporous, anion exchange resin composite containing therein the post-deposited in-situ reaction product of polymeric amorphous hydrous zirconium oxide and a source of PO_4^{---} ions,
removing from contact with said composite in said vessel, the NaCl brine with its alkaline earth metal ions being substantially removed, and
thereafter feeding said NaCl brine to the said electrolytic cell.

4,522,952
PROCESS FOR THE FLUORINATION OF POLYMERS, AND PERFLUORINATED ION EXCHANGERS

Joachim Klein, Brunswick; Hartmut Widdecke, Bokensdorf; Frank Döscher, and Fritz Pohl, both of Brunswick, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 276,929, Jun. 24, 1981, abandoned. This application Nov. 8, 1983, Ser. No. 550,054
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023455
Int. Cl.³ C08F *8/20*
U.S. Cl. 521—31 **1 Claim**

1. A process for preparing a perfluorinated cation exchanger consisting essentially of contacting a polymer with elemental fluorine in the absence of liquid solvent said polymer containing a repeating unit R—S′—Xm wherein R is a base unit forming a polymer matrix, X represents the radical SO_2F, S′ is an

aromatic or araliphatic radical with m+1 free valences and m is at least 1 to form a perfluorinated acid derivative and converting it into its corresponding free acid or an alkali metal salt thereof by treatment with water or an alkali metal salt thereof.

4,522,953

LOW DENSITY POROUS CROSS-LINKED POLYMERIC MATERIALS AND THEIR PREPARATION AND USE AS CARRIERS FOR INCLUDED LIQUIDS

Donald Barby, Chester, and Zia Haq, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 355,291, Mar. 8, 1982,. This application Sep. 24, 1984, Ser. No. 653,612

Claims priority, application United Kingdom, Mar. 11, 1981, 8107658; Jun. 26, 1981, 8119740

Int. Cl.³ C08J *9/28*

U.S. Cl. 521—64 **9 Claims**

1. A porous homogeneous cross-linked vinyl polymeric block material formed from a water-in-oil emulsion, said emulsion containing at least 90% by weight water, the polymeric block material having a dry density of less than 0.1 g/cc and formed as a cross-linked porous structure having a pore volume of more than 9 cc/g and an absorbency for hydrophobic liquids defined in terms of oleic acid of at least 7 cc/g.

4,522,954

METHOD FOR PRODUCING A LOW DENSITY FOAMED POLYESTER RESIN

Frank Ive, 1862 Ives Ave., Kent, Wash. 98031

Continuation of Ser. No. 475,052, Mar. 14, 1983,. This application Mar. 14, 1984, Ser. No. 589,040

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—78 **24 Claims**

1. A method for making a low density foam from a polyester resin comprising the steps of:

metering a predetermined amount of a polyester resin from a storage zone to a heating zone,

heating said resin to a temperature in the range of from 90° F. to 140° F. in said heating zone,

forwarding said heated resin to a first mixing zone,

metering a minor amount of a blowing agent to said first mixing zone and mixing said blowing agent with said polyester resin to form an activated resin,

forwarding said activated resin to a second mixing zone,

metering a minor amount of a catalyst to said second mixing zone and mixing said catalyst with said activated resin to form a catalyzed resin,

immediately thereafter depositing said catalyzed resin on a surface to produce a substantially uniformly dense resin product.

4,522,955

HIGHLY FOAMED POLYPROPYLENE PRODUCT AND AN EXTRUSION PROCESS FOR FORMING THE PRODUCT

Nobuo Fukushima, Otsu; Yoshihiko Kitagawa, Toyonaka; Takuzo Okumura, Ibaraki, and Kazuaki Sakakura, Moriguchi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 19, 1982, Ser. No. 379,878

Claims priority, application Japan, May 29, 1981, 56-83316

Int. Cl.³ B29D *27/00*

U.S. Cl. 521—143 **6 Claims**

1. A non-crosslinking extrusion foaming process for producing a polypropylene highly foamed product which consists essentially of feeding a polypropylene resin having, at 190° C., a minimum value of melt tension of 3 g or more and a maximum/minimum ratio of melt tension of 2.5 or less into an extruder together with a nucleus-forming agent, melting them, thereafter feeding a volatile foaming agent into the barrel of the extruder, uniformly mixing the materials, and then extruding the mixture to a low pressure zone while cooling the mixture.

4. A foamed polypropylene product produced by the process of claim 1.

4,522,956

POLY(ETHYLENE OXIDE)/POLYETHYLENE GLYCOL-CONTAINING HYDROPHILIC DENTURE ADHESIVE

Dadi J. Dhabhar, Norwalk, and Nicholas F. Schmidt, Brookfield, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Continuation of Ser. No. 403,091, Jul. 29, 1982, abandoned. This application Apr. 12, 1984, Ser. No. 599,623

Int. Cl.³ A61K *6/08*

U.S. Cl. 523—120 **9 Claims**

1. A denture adhesive composition consisting essentially of a substantially anhydrous mixture of from about 20 to about 35 percent w/w poly(ethylene oxide) homopolymer having a molecular weight of from about 100,000 to about 5,000,000 as the sole adhesive component and from about 65 to about 80 percent w/w of a polyethylene glycol fraction comprising one or more polyethylene glycols each having an average molecular weight of from 200 to 20,000 and said fraction having a viscosity of from about 44 to about 25,600 centipoises at about 60° C.

4,522,957

PROCESS FOR PREPARING CURABLE POLYOLEFIN POLYMERS

Billy H. Ashley, Wadsworth, Ohio, assignor to A. Schulman, Inc., Akron, Ohio

Filed Sep. 3, 1982, Ser. No. 414,646

Int. Cl.³ C08K *9/00, 9/06, 5/01*

U.S. Cl. 523—212 **20 Claims**

1. In a process for preparing curable polyolefin polymers in which a mass of dry, discrete, free-flowing particles of polyolefin polymer particles is tumbled in admixture with a curing agent effective to cause curing when the finished product is subjected to curing temperature, the improvement which comprises tumbling said mass in two separate and discrete steps in which essentially all of the curing agent is incorporated into said mass in the first tumbling step and equilibration between the curing agent and the polymer is effected in the second tumbling step while maintaining in both tumbling steps a temperature above the melting point of said curing agent but below both the agglomerating temperature and the curing temperature and, at least in the second tumbling step, a temperature which provides equilibration between the curing agent and the polymer; and thereafter tumble-cooling the thus treated mass until a dry, discrete, free-flowing mass of polymer particles is obtained, said process being characterized in that it is not dependent upon a curing agent of high volatility, such as di-tertiary butyl peroxide.

4,522,958

HIGH-SOLIDS COATING COMPOSITION FOR IMPROVED RHEOLOGY CONTROL CONTAINING CHEMICALLY MODIFIED INORGANIC MICROPARTICLES

Suryya K. Das, Pittsburgh; William G. Boberski, Gibsonia; Paul P. Greigger, Allison Park; James E. Jones, Lower Burrell; Raymond F. Schappert, Glenshaw, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 6, 1983, Ser. No. 529,421

Int. Cl.³ C08K *9/06*

U.S. Cl. 523—212 **30 Claims**

1. An essentially solvent-based, organic, high-solids coating composition which is conventionally sprayable at high-solids comprising:

(A) a film-forming binder system containing a crosslinkable

resin having a weight average molecular weight of from about 500 to about 10,000, and optionally a crosslinking agent for the crosslinkable resin:

(B) substantially colorless, substantially inorganic microparticles stably dispersed in the coating composition, the microparticles prior to incorporation in the coating composition ranging in size from about 1 to about 150 nanometers and in the form of a sol of the microparticles in which carbon-containing molecules are chemically bonded to the surface of the inorganic microparticles; and

(C) a solvent system for the crosslinkable resin and the optional crosslinking agent;

wherein the crosslinkable resin is in an amount of from about 15 to about 95 percent by weight and the substantially inorganic microparticles are in an amount of from about 1 to about 20 percent by weight, based on the sum of the weights of the crosslinkable resin, the optional crosslinking agent, and the inorganic microparticles.

4,522,959

THERMOPLASTIC COMPOSITIONS IN POWDER FORM

Christian Lindner, Cologne; Karl-Heinz Ott, Leverkusen, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,284

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312540

Int. Cl.³ C08J *3/00*

U.S. Cl. 523—335 **2 Claims**

1. In an improved process for the production of a pulverulent mixture consisting of

(A) from 60 to 99 parts, by weight of the pulverulent mixture, of a brittle copolymer consisting of from 35 to 5%, by weight of brittle copolymer, of acrylonitrile and from 95 to 65%, by weight of brittle copolymer, of a monomer of styrene, α-methylstyrene, methyl methacrylate or mixtures thereof; and

(B) from 1 to 40 parts, by weight of the pulverulent mixture, of a rubber-elastic polymer of (1) a flexible rubber-elastic polymer having a glass transition temperature less than 20° C., (2) a graft polymer, the rubber basis of which has a glass transition temperature of less than 20° C., or mixtures of (1) and (2),

the improvement consisiting of;

in a first stage, a latex of (A) or a mixture of a latex of (A) and a part of a latex of (B) are coagulated by the addition of a coagulant at a temperature of from 20° to 100° C.,

in a second stage, the latex of (B) or the remaining part of the latex of (B) is added and a sufficient amount of additional coagulent, water or mixtures thereof, is added during the second stage or after the second stage, but before a third stage to obtain a solids to water weight ratio of from 1:3 to 1:15, and

in a third stage, the precipitated mixture of (A) and (B) is separated from the aqueous phase and dried.

4,522,960

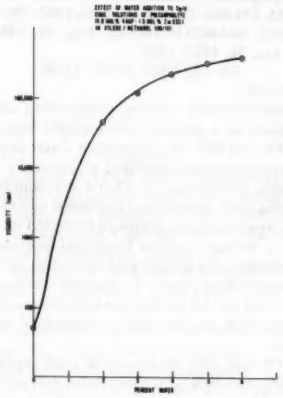
CONTROLLED GELATION ON NONAQUEOUS SOLUTIONS CONTAINING LOW CHARGE DENSITY POLYAMPHOLYTES

Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,218

Int. Cl.³ C08L *39/00*

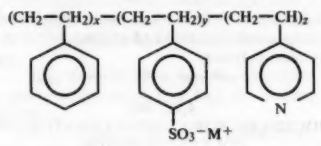
U.S. Cl. 523—339 **12 Claims**



1. A process for gelling a nonpolar organic liquid having a viscosity of at least about 50 cps which includes the steps of:

(a) forming a solvent system of said nonpolar organic liquid and a polar cosolvent, said polar cosolvent being less than about 15 weight percent of said solvent system and a viscosity of said solvent system being less than about 100 cps;

(b) dissolving a water insoluble, oil soluble terpolymer in said solvent system to form a solution, a concentration of said terpolymer in said solution being about 0.2 to about 10 weight percent and a viscosity of said solution being less than about 2000 cps, said terpolymer having the formula:



wherein x is about 40 to about 98 mole %, y is about 1 to about 50 mole %, and z is about 1 to about 50 mole %, wherein y and z are less than 60 mole %, and M is an amine or a metal cation selected from the group consisting of antimony tin, lead, Groups IA, IIA, IB and IIB of the Periodic Table of Elements; and

(c) adding about 5 to about 500 volume percent water to said solution of said terpolymer, said water being immiscible with said solution of said terpolymer, said polar cosolvent transferring from said nonpolar organic liquid to said water thereby causing the viscosity of said organic liquid to increase to at least 5000 cps.

4,522,961

AQUEOUS SELF-CURING POLYMERIC BLENDS

Phillip C. Martino, Brunswick, and Peter P. Winner, North Royalton, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 468,364, Feb. 22, 1983, abandoned. This application Jan. 30, 1984, Ser. No. 575,287

Claims priority, application Finland, Aug. 10, 1983, 832883; New Zealand, Aug. 10, 1983, 205206; Australia, Aug. 11, 1983, 17909/83; Canada, Aug. 11, 1983, 434383; Denmark, Aug. 11, 1983, 3659/83; European Pat. Off., Aug. 11, 1983, 83304656.8; Rep. of Korea, Aug. 11, 1983, 3754/83; Mexico, Aug. 11, 1983, 198360; Norway, Aug. 11, 1983, 832885; Portugal, Aug. 11, 1983, 77186[U]; South Africa, Aug. 11, 1983, 83/5923; Spain, Aug. 11, 1983, 524.884; Ireland, Aug. 12, 1983, 1907/83; Japan, Aug. 12, 1983, 58-146741; Taiwan, Aug. 18, 1983, 7212830; Venezuela, Aug. 31, 1983, 1343

Int. Cl.³ C08L *63/00, 51/00*

U.S. Cl. 523—407 77 Claims

1. A water-dispersed coating composition comprising a polymeric blend on a polymer solids weight basis:

between 5% and 99% of a self-curing water dispersed polymer comprising copolymerized ethylenically unsaturated monomers comprising (a) alkylol acrylamide monomer, (b) ethylenically unsaturated functional monomer containing reactive functional groups and selected from carboxyl, hydroxyl, amine, or amide functional monomers, and (c) other ethylenically unsaturated monomer, said monomers copolymerized in water to produce polymer particles wherein said alkylol acrylamide monomer is preferentially copolymerized on the surface portion of said polymer particles;

between 1% and 70% epoxy-acrylic graft copolymer; and

between 0% and 50% of a phosphated polymer.

4,522,962

EPOXY MODIFIED EMULSION POLYMERS

Kirk J. Abbey, Cleveland, and James R. Erickson, Brunswick, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Sep. 8, 1980, Ser. No. 185,253

Int. Cl.³ C08G *59/00;* C08K *3/20*

U.S. Cl. 523—410 8 Claims

1. In an emulsion polymerization process the improvement comprising the steps of:

providing a blend comprising on a weight basis, between 0.1% and 40% of an epoxy resin polymer, between 30% and 99.8% ethylenically unsaturated monomers, and between 0.1% and 30% oxirane containing ethylenically unsaturated monomers, and polymerizing said blend in an aqueous medium in the presence of polymerization catalysts to copolymerize said ethylenically unsaturated monomers with said oxirane containing ethylenically unsaturated monomers to form an oxirane polymer and provide an in situ emulsified blend of oxirane polymer and said epoxy resin polymer.

4,522,963

PROCEDURE FOR CURING UNSATURATED POLYESTER RESINS

Géza Kecskeméthy; István Kovácsay, and László Magdányi, all of Budapest, Hungary, assignors to Müanyagipari Kutató Intézet, Budapest, Hungary

Filed Oct. 13, 1983, Ser. No. 541,433

Int. Cl.³ C08L *67/06*

U.S. Cl. 523—510 4 Claims

1. A process for monitored cross-linking of unsaturated polyester resins in the presence of a metal-ion-containing accelerator and an organic peroxide initiator which comprises conducting the cross-linking in the presence of a color-producing compound selected from the group consisting of alizarin, sodium alizarinesulfonate, 3-nitroalizarin, chinizarine, or purpurin, in a ratio of from 0.005 to 0.5 percent mass/mass compared to the mass of the polyester resin, and tracking the cross-linking by means of the color change in the reaction mixture.

4,522,964

POLYMER POWDERS CONTAINING GRAFT POLYMER

Christian Lindner, Cologne; Walter Uerdingen, Leverkusen; Jürgen Hinz, and Ludwig Trabert, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,345

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312541

Int. Cl.³ C08L *31/04, 33/06, 33/20, 51/04*

U.S. Cl. 524—71 11 Claims

1. A process for the production of polymer mixtures in powder form having an average particle diameter of 0.05–5 mm which comprises:

(i) coagulating in a first stage, a latex of (A) or a mixture of a latex of (A) and a portion of the requisite amount of a latex of (B) at a temperature of from 20° to 100° C. by the addition of a coagulating agent, and

further coagulating in a second stage the product from (i) with a latex of (B) or the remaining portion of the requisite amount of the latex of (B) whereby the desired quantity ratio of (A) and (B) is attained, and until a solids/water weight ratio of from 1:3 to 1:15 is attained, and

(iii) separating in a third stage the precipitated mixture of (A) and (B) from the aqueous phase and drying the product wherein the proportion of graft polymer in the product obtained is at least 10%, by weight; wherein

(A) is from 95–20% by weight of the polymer mixture and comprises:

(A1) a rubbery polymer from the series of diene- or alkyl acrylate homo- or copolymers with styrene, acrylonitrile, methyl methacrylate, vinyl acetate or vinyl ether and which has a glass transition temperature of ≦35° C.; or

(A2) a graft polymer wherein monomers including styrene, acrylonitrile, methyl methacrylate or mixtures thereof are grafted on diene or alkyl acrylate rubbers and having a rubber content, based on the graft polymer of from 50 to 95%, by weight, and has a glass transition temperature of <20° C.; or

(A3) a mixture of said rubbery polymer (A1) and said graft polymer (A2); and wherein

(B) is from 5 to 80% by weight of the polymer mixture and comprises:

(B1) a rigid thermoplastic polymer of styrene, α-methylstyrene, acrylonitrile, methyl methacrylate and mixtures thereof; or

(B2) a graft polymer wherein monomers including styrene, α-methylstyrene, acrylonitrile, methyl methacrylate or mixtures thereof are grafted on diene rubbers or alkyl acrylate rubbers and having a rubber content less than 50%, by weight, based on the graft polymer, and having a glass transition temperature of <20° C.; or

(B3) a mixture of said rigid thermoplastic polymer (B1) and said graft polymer (B2).

4,522,965

THERMOPLASTIC CONTACT ADHESIVES CONTAINING EPOXIDE PLASTICIZERS

Helmut Waniczek, Cologne; Herbert Bartl, Odenthal; Gerhard Hohmann, and Ludwig Mott, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,226

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342307

Int. Cl.³ C09J *3/14, 5/06*

U.S. Cl. 524—109 4 Claims

1. Thermoplastic contact adhesive, containing:

(a) from 60 to 100 parts, by weight, of a graft copolymer composed of from 65 to 97%, by weight of graft base consisting of a copolymer of from 45 to 65% by weight, of ethylene units with from 35 to 55% by weight, of vinyl acetate units and optionally up to 10%, by weight of units of other unsaturated compounds, and from 35 to 3% by weight of grafted monomer units, consisting of from 80 to 100% by weight, of methyl methacrylate units and from 0 to 20% by weight, of units of other unsaturated compounds;

(b) from 3 to 50 parts, by weight, of a plasticizer containing epoxide groups or of a mixture of various plasticizers containing epoxide groups;

(c) from 60 to 200 parts, by weight, of an adhesifying resin; and

(d) from 0 to 20 parts, by weight, of other additives; characterized in that the plasticizers containing epoxide groups are epoxidized oils or epoxidized fatty acid esters of alcohols having from 1 to 12 carbon atoms.

4,522,966

NON-FOGGING COATING COMPOSITION AND A SHAPED ARTICLE COATED THEREWITH

Masaaki Funaki, Toyonaka; Noboru Ohtani; Motoaki Yoshida, both of Nishinomiya; Akira Fujioka, Osaka, and Kazuo Sakiyama, Ibaraki, all of Japan, assignors to Nippon Sheet Glass Co., Ltd. and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Filed May 28, 1981, Ser. No. 268,106

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—114 **15 Claims**

1. A non-fogging transparent coating composition free of organophosphate esters and amine aldehyde crosslinking agents, which comprises:

(A) 0 to 50 parts by weight

(calculated as $R_a^1-Si(R_b^2)-O_{\frac{4-a-b}{2}}$)

of at least one compound selected from the group consisting of epoxy group-containing organic silane compounds represented by the general formula (1):

$$R_a^1-Si(R_b^2)-(OR^3)_{4-a-b} \quad (1)$$

wherein R^1 stands for an organic group having an epoxy group, R^2 for a hydrogen atom, a hydrocarbon group having 1 to 6 carbon atoms or a vinyl group, R^3 for a hydrocarbon group having 1 to 5 carbon atoms, an alkoxyalkyl group or an acyl group having 1 to 4 carbon atoms, a for an integer having the value of 1 to 3 and b 0 or for an integer having the value of 1 to 2, providing that $a+b \leqq 3$ is satisfied, and partial hydrolyzates thereof,

(B) 20 to 80 parts by weight selected from triethylene glycol and a polyhydric alcohol which has an ethylene oxide chain and a molecular weight of 200 to 2000 and is capable of reacting with a component (C) as defined below or a mixture of the components (A) and (C) to form a coating film,

(C) 10 to 75 parts by weight of a polymer or copolymer containing at least 20% by weight of repeating structural units represented by the general formula (2):

$$-CH-C- \quad (2)$$
$$\quad\quad X$$

wherein, R^4 and R^5 independently stand for a hydrogen atom, a lower alkyl group or a carboxyl group and X stands for a side chain possessing an epoxy group, and

(D) a catalytic amount of a perchlorate curing catalyst, providing that the total of the amounts of the aforementioned components (A), (B) and (C) is 100 parts by weight.

4,522,967

HEAT SEALABLE WATER DISPERSIBLE ADHESIVE

Donald A. Sheldon, Outagamie County, Wis.; Bruce G. Stokes, Cherokee County, Ga.; Robert E. Weber, Cobb County, Ga., and Edwin G. Greenman, Cherokee County, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 8, 1984, Ser. No. 618,810

Int. Cl.³ C08K *5/06, 5/05;* **C08L** *79/04*

U.S. Cl. 524—377 **3 Claims**

1. A water dispersible heat activatable adhesive comprising:

25–87.5 parts by weight polyethyloxazoline

75–12.5 parts by weight polyethyloxazoline

compatible water dispersible plasticizer with a Tg below about 10° C. and an anti-blocking agent at a level of 5 to 35 parts per 100 parts of the polyethyloxazoline plasticizer mixture said anti-blocking agent selected from the class consisting of moderate molecular weight polyethylene glycol and moderate molecular weight polypropylene glycol.

4,522,968

PROCESS FOR THE PREPARATION OF WATER-IN-WATER SECONDARY DISPERSIONS OF WATER-SOLUBLE POLYMERS AND THEIR UTILIZATION AS FLOCCULANTS

Heinrich Horacek, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,106

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318218

Int. Cl.³ C08L *33/00, 33/26;* **C08K** *5/10*

U.S. Cl. 524—388 **14 Claims**

1. Process for the preparation of water-in-water secondary dispersions of water-soluble polymers wherein powdered homopolymers or copolymers of (meth)acrylamides, (meth)acrylic acid and (meth)acrylic acid esters of amino alcohols or their salts are dispersed in an aqueous solution containing from about 2 to 50 percent by weight of a polymer of ethylene oxide and/or propylene oxide having a molecular weight of from 500 to 10,000.

13. The process of clarifying coal slurries and waste water and for processing ore comprising adding to such liquid the water-in-water secondary dispersions produced by the process of claim 2.

4,522,969
MODIFIED POLYURETHANE LIQUID POLYMER COMPOSITIONS

James M. O'Connor, Clinton; Donald L. Lickel, Cheshire, and Michael L. Rosin, Madison, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 467,005, Feb. 16, 1983, abandoned, which is a division of Ser. No. 306,848, Sep. 29, 1981, Pat. No. 4,439,576, which is a continuation-in-part of Ser. No. 203,212, Nov. 3, 1980, abandoned, and a continuation-in-part of Ser. No. 203,213, Nov. 3, 1980, abandoned. This application Mar. 20, 1984, Ser. No. 591,645

Int. Cl.[3] C08K *3/26*

U.S. Cl. 524—425 17 Claims

1. A process for preparing a polyurethane polymer product comprising mixing a polyurethane oligomer, a heat activated free radical generating catalyst, and at least one additional component selected from a reinforcing agent and a filler to a homogeneous blend, and then heating said mixture at a temperature adequate to activate said catalyst and cure said mixture, said polyurethane oligomer having an equivalent ratio of NCO to OH from about 0.8/1 to about 2/1 and being prepared by reacting

(a) an organic polyisocyanate;

(b) a polyol reactant comprising

(i) a high functionality polyol having an average equivalent weight from about 75 to about 500 and an average functionality of at least about 3, said high functionality polyol being prepared by reacting an alkylene oxide, or a mixture of alkylene oxides, with a polyhydric initiator comprising a carbohydrate or a carbohydrate derivative, and

(ii) a chain extender having an average equivalent weight from about 31 to about 4,000 and an average functionality of about 2, said chain extender being employed in an amount ranging from about 20 to about 1,500 parts by weight per 100 parts by weight of said high functionality polyol; and

(c) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of

(i) hydroxyalkyl acrylates,

(ii) hydroxyalkyl methacrylates,

(iii) hydroxyalkyl acrylamides, and

(iv) mixtures thereof; and

wherein there is employed an equivalent ratio of said isocyanate reactive group-containing unsaturated monomer to said polyol reactant in the range from about 0.6/1 to about 3/1.

4,522,970
TIRE WITH TREAD RUBBER CONTAINING MEDIUM VINYL POLYBUTADIENE WITH CLAY AND CARBON BLACK

Richard M. Scriver, Grand Duchy Luxembourg, Luxembourg, and Wayne H. Stair, Munroe Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 25, 1984, Ser. No. 624,326

Int. Cl.[3] C08K *3/34, 3/04;* C08L *9/00, 9/06*

U.S. Cl. 524—447 11 Claims

1. A pneumatic tire having an outer circumferential tread adapted to be ground contacting, where said tread is a sulfur cured product of an elastomeric composition comprised of, based on 100 parts of weight rubber (phr), (A) about 50 to about 90 phr of medium vinyl polybutadiene rubber having about a 30 to about 55 percent vinyl content and having in its unvulcanized state, an ML4(100° C.) viscosity in the range of about 40 to about 120, (B) about 50 to about 10 phr of at least one rubber selected from cis 1,4-polyisoprene rubber, cis 1,3-polybutadiene rubber and styrene/butadiene copolymer rubber (C) about 5 to about 20 phr kaolin clay, (D) about 50 to about 80 phr reinforcing carbon black and (E) about 1 to about 6 phr of a 3,3'-bis(trimethoxysilylpropyl) polysulfide.

4,522,971
POLYMERS CONTAINING RESORCINOL MONOBENZOATE

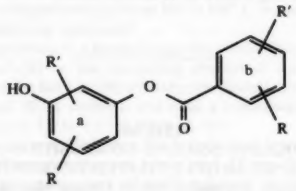
Michael DeBergalis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1983, Ser. No. 469,689

Int. Cl.[3] C08F *8/30*

U.S. Cl. 524—547 16 Claims

1. A polymer comprising a polymeric moiety reacted with resorcinol monobenzoate or a derivative containing resorcinol monobenzoate, said moiety being bound to the hydroxyl group on the resorcinol monobenzoate through a linking group, wherein the polymer contains, by weight, 12.5–80% resorcinol monobenzoate, the balance being said moiety, said linking group including at least one group selected from the group consisting of ether, carbonate, and urethane groups and ester groups containing at least two carbon atoms, said derivative fitting the structure



wherein R and R' are hydrogen or alkyl or alkoxy groups containing 1–14 carbon atoms, and wherein there is at least one unsubstituted position on the a ring ortho to the carbonyl groups.

4,522,972
PROCESS FOR THE PREPARATION OF AN AQUEOUS COPOLYMER DISPERSION

Josef Mondt, Königstein, and Thaddäus Wirth, Heidenrod-Wisper, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,415

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128062

Int. Cl.[3] C08L *37/00, 39/00*

U.S. Cl. 524—548 3 Claims

1. A process for the preparation of an aqueous dispersion of a copolymer which can be crosslinked with an aminoplast resin by the action of heat and which is prepared by copolymerization of monomers from the group comprising styrene, esters of acrylic acid, esters of methacrylic acid, vinyl esters, monoolefinic unsaturated monomers having hydroxyl groups, acrylic acid, methacrylic acid, and unsaturated amides, in an aqueous phase in the presence of a radical-forming initiator and an emulsifier, which comprises copolymerizing a mixture of

30 to 60 parts by weight of styrene,

20 to 50 parts by weight of an ester of acrylic acid or of methacrylic acid, the homopolymer of which has a glass temperature T_G below +50° C., or a mixture of these esters,

5 to 30 parts by weight of a vinyl ester of a branched saturated monocarboxylic acid, which has side chains having 8 to 12 carbon atoms and in which the carboxyl group is on a tertiary carbon atom,

5 to 15 parts by weight of a hydroxyalkyl ester of a monoolefinic unsaturated monocarboxylic acid,

0.5 to 15 parts by weight of an α,β-unsaturated monocarboxylic acid and/or unsaturated dicarboxylic acid, and

0.1 to 8 parts by weight of an addition product of a glycidyl ester of a branched monocarboxylic acid with an unsaturated monocarboxylic or dicarboxylic acid.

2. The process as claimed in claim 1, wherein, in addition, 0.1

to 5 parts by weight of an unsaturated amide are copolymerized.

3. The product obtained according to the process as defined in claims 1 or 2.

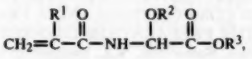
4,522,973

LOW TEMPERATURE CROSSLINKABLE EMULSION

David A. Ley, Stamford, Conn., and Herbert Burkhard, Eastchester, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 6, 1983, Ser. No. 529,237
Int. Cl.³ C08J *39/00*; C08K *39/00*
U.S. Cl. 524—555 **12 Claims**

1. A low temperature crosslinkable emulsion comprising (a) an emulsified, crosslinkable polymer containing repeating units derived from an activated ester-containing vinyl monomer of the formula



wherein the R^1 group is H or methyl, and the R^2 and R^3 groups are independently selected from alkyls of 1–4 carbon atoms; with any balance of repeating units derived from one or more copolymerizable ethylenically unsaturated comonomers; and (b) a crosslinking agent having a plurality of primary amine groups each capable at low temperature of replacing the OR^3 moiety by nucleophilic substitution, upon coalescence of micelles of said emulsion which occurs upon evaporation of water therefrom;

wherein the crosslinkable polymer contains a sufficient amount of said repeating units derived from said activated ester-containing vinyl monomer, and said crosslinking agent is present in a sufficient amount, to produce a crosslinked polymer upon said coalescence.

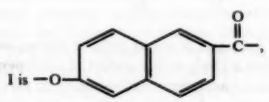
4,522,974

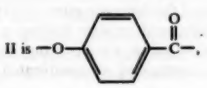
MELT PROCESSABLE POLYESTER CAPABLE OF FORMING AN ANISOTROPIC MELT COMPRISING A RELATIVELY LOW CONCENTRATION OF 6-OXY-2-NAPHTHOYL MOIETY-4-BENZOYL MOIETY, 1,4-DIOXYPHENYLENE MOIETY, ISOPHTHALOYL MOIETY AND TEREPHTHALOYL MOIETY

Gordon W. Calundann, North Plainfield; Larry F. Charbonneau, Chatham, and Brian C. Benicewicz, Cranford, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 401,932, Jul. 26, 1982, abandoned. This application May 6, 1983, Ser. No. 492,103
Int. Cl.³ C08G *63/60*
U.S. Cl. 524—605 **22 Claims**

1. A melt processable polyester capable of forming an anisotropic melt phase at a temperature below approximately 400° C. consisting essentially of the recurring moieties I, II, III, and IV wherein:





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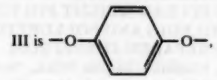
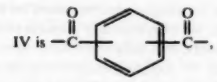


where the aromatic ring optionally may include substitution of at least some of the hydrogen atoms present thereon selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures of the foregoing, and



where the aromatic ring optionally may include substitution of at least some of the hydrogen atoms present thereon selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures of the foregoing, and wherein approximately 40 to 90 mole percent of moiety IV is isophthaloyl moiety and approximately 10 to 60 mole percent of moiety IV is terephthaloyl moiety, and wherein said polyester comprises approximately 3 to 15 mole percent of moiety I, approximately 20 to 70 mole percent of moiety II, approximately 7.5 to 38.5 mole percent of moiety III, and approximately 7.5 to 38.5 mole percent of moiety IV.

4,522,975

SELECT NCO-TERMINATED, URETDIONE GROUP-CONTAINING POLYURETHANE PREPOLYMERS AND LIGNOCELLULOSIC COMPOSITE MATERIALS PREPARED THEREFROM

James M. O'Connor, Clinton; Theodore C. Kraus, Cheshire, and Wilhelm J. Schnabel, Branford, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 1, 1984, Ser. No. 616,453
Int. Cl.³ C08L *75/00*; C08G *18/74*
U.S. Cl. 524—702 **19 Claims**

1. A process for preparing an NCO-terminated, uretdione group-containing polyurethane prepolymer, comprising reacting a uretdione group-containing organic polyisocyanate with an isocyanate reactive hydrogen atom-containing compound in an equivalent ratio of NCO to OH ranging from about 1.5/1 to about 2/1, said uretdione group-containing organic polyisocyanate being derived from an organic polyisocyanate selected from the group consisting of 2,4-toluene diisocyanate; 2,6-toluene diisocyanate; isomeric mixtures of 2,4- and 2,6-toluene diisocyanate; methylene-bis (4-phenyl isocyanate); xylene diisocyanate; 3,3'-bitoluene-4,4'-diisocyanate; naphthalene 1,5-diisocyanate; and mixtures thereof, and said isocyanate reactive hydrogen atom-containing compound having an equivalent weight of less than about 500 and an average functionality from about 2 to about 8 and being selected from the group consisting of polyester polyols, polyether polyols and mixtures thereof.

4,522,976
GRAFT POLYMER DISPERSION IN A MIXTURE OF LOW MOLECULAR WEIGHT POLYOLS AND POLYETHER POLYOLS AND POLYURETHANE FOAMS PREPARED THEREFROM

Oscar M. Grace, Madison Heights, Mich.; Steven E. Wujcik, Long Beach, Calif., and Duane A. Heyman, Monroe, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 17, 1984, Ser. No. 611,134
Int. Cl.³ C08L *25/08*
U.S. Cl. 524—722 **16 Claims**

1. A stable low viscosity graft polymer dispersion prepared by polymerizing in the presence of a free radical initiator from about 25 to about 70 weight percent based on the total weight of the dispersion, an ethylenically unsaturated monomer or mixture of monomers, in a polyol mixture comprising (1) from about 25 to about 99 weight percent of a polyol containing from 2 to 8 hydroxyl groups and having an equivalent weight from 30 to about 200, and (2) from about 1 to about 75 weight percent of a macromer containing induced unsaturation, said macromer comprising the reaction product of a polyether polyol having an equivalent weight from 100 to 10,000 with a compound having both ethylenic unsaturation and a group selected from the group consisting of a hydroxyl, carboxyl, anhydride, isocyanate, and epoxy group or mixtures thereof.

4,522,977
PROCESS FOR PRODUCING DICYCLOPENTADIENYL-MODIFIED POLYESTER COMPOSITIONS

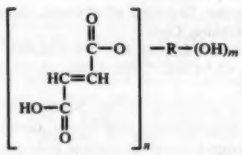
Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1984, Ser. No. 625,914
Int. Cl.³ C08G *63/76*
U.S. Cl. 525—48 **16 Claims**

1. A process for preparing a polyester composition comprising the steps of:

(a) contacting a molar excess of an alpha, beta unsaturated dicarboxylic acid or derivative thereof with an organic polyol for a time and at a temperature sufficient to form a composition comprising a carboxylic acid terminated polyester having the formula:

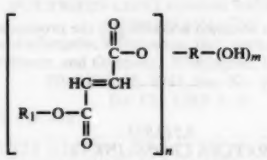
(I)



wherein n is a number having an average value of about 2 to less than about 4, m is a number equal to the free valence of R less the average value of n, the ratio of n to m is greater than about 2.0, and R is the residuum of a polyester which contained from 2 to 4 inclusive hydroxyl groups; and

(b) contacting a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof with the carboxylic acid terminated polyester of (a) in the presence of a non-oxidizing acid catalyst having a non-nucleophilic anion for a time and at a temperature sufficient to form a composition comprising an unsaturated ester having the formula:

(II)



wherein n, m and R are as defined above and R_1 is the residuum of a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof having from 2 to about 20 carbon atoms.

16. A composition prepared according to the process of claim **1**.

4,522,978
LOW VISCOSITY, DICYCLOPENTADIENYL-MODIFIED POLYESTER COMPOSITIONS AND A PROCESS FOR THE PREPARATION THEREOF

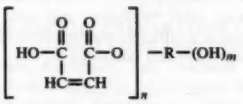
Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1984, Ser. No. 626,144
Int. Cl.³ C08G *63/76*
U.S. Cl. 525—48 **15 Claims**

1. A process for preparing a polyester composition comprising the steps of:

(a) contacting maleic acid or anhydride with an organic polyol for a time and at a temperature sufficient to form a composition comprising a maleate ester having the formula:

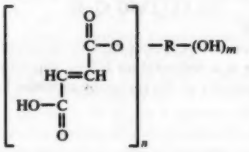
(I)



wherein n is a number having an average value of about 2 to less than about 4, m is a number equal to the free valence of R less the average value of n, the ratio of n to m is greater than about 2.0, and R is the hydroxyl-free residue of an organic polyol which contained from 2 to 4 inclusive hydroxyl groups;

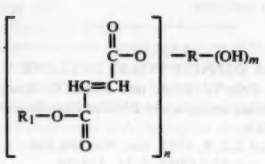
(b) heating the maleate ester of (a) in the presence of a catalyst for a time and at a temperature sufficient to form a composition comprising a fumarate ester having the formula:

(II)



wherein n, m and R are as defined above; and

(c) contacting a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivatives thereof with about stoichiometric amounts of carboxyl groups of the fumarate ester of (b) in the presence of a non-oxidizing acid catalyst having a non-nucleophilic anion for a time and at a temperature sufficient to form a composition comprising an unsaturated ester having the formula:



(III)

wherein n, m and R are as defined above and R_1 is the residuum of a Diels-Alder adduct of cyclopentadiene and an olefinic or acetylenic hydrocarbon and alkylated derivatives thereof having from 2 to about 20 carbon atoms.

15. A composition prepared according to the process of claim 1.

4,522,979

MOLDING COMPOSITIONS HAVING AN ENHANCED RESISTANCE TO GASOLINE

James Y. J. Chung, New Martinsville, W. Va., and James W. Rosthauser, Imperial, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Feb. 17, 1984, Ser. No. 581,479
Int. Cl.[3] C08L *67/02, 69/00*
U.S. Cl. 525—66 8 Claims

1. A thermoplastic molding composition comprising

(a) a blend containing

(i) about 10 to about 80% of a thermoplastic polyester having an intrinsic viscosity of at least about 0.4 dl/gm measured as a 1% solution in a 60:40 mixture of phenol and tetrachloroethane at 30° C.,

(ii) about 15 to about 85% of a thermoplastic aromatic polycarbonate resin having a weight average molecular weight of about 10,000 to about 200,000,

(iii) about 5 to about 30% of a substantially uniformly dispersed impact modifier which is a rubbery compound selected from the group consisting of natural rubbers and synthetic rubbers, having a glass transition temperature below 20° C., and

(b) a blocked polyisocyanate prepolymer in sufficient amount to impart to said blend improved impact strength and gasoline resistance,

said percents being in relation to the weight of said blend.

4,522,980

IMPACT MODIFIED COPOLYESTER CARBONATE COMPOSITIONS

Kenneth F. Miller, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1982, Ser. No. 452,909
Int. Cl.[3] C08L *69/00*
U.S. Cl. 525—67 5 Claims

1. A composition comprising in admixture

a. an aromatic copolyester carbonate composition comprising a polymer derived from

i. a dihydric phenol,

ii. a carbonate precursor, and

iii. a further composition providing isophthalate units to the said aromatic copolyestercarbonate composition, wherein the further composition cannot supply more than 25% terephthalate units to the total ester units of the said aromatic copolyestercarbonate which has from about 25 to about 90 mole percent ester bonds; and

b. an impact modifier comprising a polyacrylate or an olefin comonomer and polyacrylate which improves the impact properties of aromatic polycarbonates, said impact modifier composition present in quantities which improves the impact properties of the said aromatic copolyestercarbonate, said quantities from about 2 to about 15 weight percent of the impact modifier plus aromatic copolyestecarbonate.

4,522,981

SYNTHETIC RESIN

Michael Geist, Münster, Fed. Rep. of Germany, assignor to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,292
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130545
Int. Cl.[3] C08F *8/30*
U.S. Cl. 525—124 6 Claims

1. A synthetic resin based on an acrylate copolymer containing epoxide groups and having a number average molecular weight of 1,000 to 30,000, said acrylate copolymer comprising:

(a) 20 to 90% by weight of a first acrylate selected from the group consisting of alkyl acrylate having 1 to 18 carbon atoms in the alkyl radical and alkyl methacrylate having 1 to 20 carbon atoms in the alkyl radical;

(b) 5 to 40% by weight of a second acrylate having hydroxyl groups selected from the group consisting of hydroxyalkyl acrylate and hydroxyalkylmethacrylate; and

(c) 5 to 40% by weight of monomers containing epoxide groups selected from the group consisting of glycidylacrylate, and glycidylmethacrylate, and the total amount of components (a), (b), and (c) being 100%; and said hydroxyl groups of said acrylate having been reacted in solution at 60°–100° C. with a partially blocked isocyanate selected from the group consisting of diisocynate and polyisocyanate to a free isocyanate content of less than 1%, and, upon subsequent baking to at an elevated temperature, isocyanate groups are liberated from said blocked isocyanate to react with said epoxide groups of component (c) to form oxazolidinone rings.

4,522,982

ISOTACTIC-STEREOBLOCK POLYMERS OF ALPHA-OLEFINS AND PROCESS FOR PRODUCING THE SAME

John A. Ewen, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 6, 1983, Ser. No. 501,588
Int. Cl.[3] C08F *110/06, 4/64*
U.S. Cl. 525—240 11 Claims

1. Normally solid isotactic-stereoblock polypropylene comprising recurring polypropylene units, said isotactic-stereoblock polypropylene characterized by comprising alternating blocks of monomers having an average block length greater than 2 having methine carbons with the same relative configuration and wherein the methine carbon atoms in adjacent blocks are of opposite configuration.

4,522,983

POLYMERIC MOLDING COMPOSITION

Bi Le-Khac, West Chester, Pa., and Clyde Sharik, Plainsboro, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 9, 1983, Ser. No. 473,835
Int. Cl.[3] C08F *279/02*
U.S. Cl. 525—285 8 Claims

1. A polymeric molding composition resulting from the polymerization of 100 parts by weight of (A) from about 55 to about 99.8% by weight styrene, (B) from about 0.2 to about 5% or more by weight of at least one isomer of methylstyrene selected from the group consisting of para-methylstyrene, ortho-methylstyrene and meta methylstyrene, (C) from 5 to about 40% by weight of an unsaturated dicarboxylic acid anhydride, wherein the percentages of (A), (B) and (C) are based on the total combined weight of (A) plus (B) plus (C), in the presence of from about 1 to about 40 total parts by weight of at least one preformed rubbery polymer.

4,522,984

MODIFIED EPOXY RESIN AND COMPOSITION

Shoji Watanabe, and Kiyoshi Okitsu, both of Ohtake, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 385,212, Jun. 4, 1982, abandoned. This application Mar. 1, 1984, Ser. No. 583,793

Claims priority, application Japan, Jul. 31, 1981, 56-120507

Int. Cl.³ C08L *67/04*

U.S. Cl. 525—415 **6 Claims**

1. A lactone-modified epoxy resin which is the reaction product obtained by effecting ring-opening polymerization of from 3 to 95 parts by weight of ϵ-caprolactone, in the presence of from 97 to 5 parts by weight of an epoxy resin having terminal unreacted epoxy groups and having at least one hydroxyl group in the epoxy resin molecule, at a temperature of from 100° to 240° C., in the presence of a catalytically effective amount of a catalyst effective for polymerizing ϵ-caprolactone and selected from the group consisting of titanium compounds, organotin compounds and stannous halides, the conditions being effective to form poly(ϵ-caprolactone) as a side chain bonded to the epoxy resin molecule at the location of said hydroxyl group or groups, said poly(ϵ-caprolactone) side chain having a terminal primary hydroxyl group at the end thereof remote from said epoxy resin molecule, whereby to obtain a lactone-modified epoxy resin, and then reacting at least some of said terminal unreacted epoxy groups of said lactone-modified epoxy resin with a primary or secondary amine.

4,522,985

HEAT CURABLE SILICONE-POLYIMIDE BLOCK COPOLYMERS

Hong-Son Ryang, Camarillo, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,569

Int. Cl.³ C08G *69/48*

U.S. Cl. 525—431 **7 Claims**

1. Heat curable compositions comprising,

(A) an effective amount of an organic peroxide selected from the class consisting of benzoyl peroxide, dicumyl peroxide, 2,5-dimethyl-2,5-ditertiarybutylperoxyhexane, tertiary butylperbenzoate, bis(2,4-dichlorobenzoyl)peroxide, tertiary butyl peroxide and tertiarybutylperoxyisopropyl carbonate, and

(B) a norbornane or norbornene block copolymer comprising chemically combined blocks of a member selected from

(i) polydiorganosiloxane and

(ii) a mixture of polydiorganosiloxane and polyimide where the organo radicals of the polydiorganosiloxane are selected from the class consisting of the same or different $C_{(1-13)}$ monovalent hydrocarbon radicals and substituted $C_{(1-13)}$ monovalent hydrocarbon radicals and where the norbornane or norbornene groups in the block copolymer are substituted with radicals selected from the class consisting of hydrogen and $C_{(1-8)}$ alkyl radials.

4,522,986

UREA FLOW CONTROL AGENTS FOR URETHANE PAINT PREPARED BY REACTION OF AN ISOCYANATE-TERMINATED PREPOLYMER AND AN ETHANOLAMINE

William T. Short, Southfield, and Robert A. Ottaviani, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1984, Ser. No. 633,025

Int. Cl.³ C08G *18/10*

U.S. Cl. 525—458 **3 Claims**

1. A thixotropic flow control agent compatible with sprayable urethane paint compositions being an uncrosslinked oligomeric urea reaction product of an isocyanate-terminated prepolymer and an ethanolamine selected from the group consisting of monoethanolamine, diethanolamine, and triethanolamine, said flow control agent when added to a polyurethane paint composition preferably pigmented, reduces sagging of said paint during spraying.

4,522,987

LOW DENSITY POLYETHYLENE

John P. Hogan; Eric T. Hsieh, and James C. Randall, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 9, 1982, Ser. No. 396,930

Int. Cl.³ C08F *2/34, 210/16*

U.S. Cl. 526—106 **8 Claims**

1. An ethylene-hexene-1 copolymer having a density of 0.910–0.935 and a relative comonomer dispersity of over 100%.

4. A process to produce ethylene-monoolefin copolymers comprising contacting a gas mixture containing ethylene and another monoolefin selected from the group consisting of 1-butene, 1-hexene, 1-octene and 4-methyl-1-pentene with a silica/titania/chromium oxide catalyst, said silica and titania being coprecipitated, under gas phase polymerization conditions in a polymerization zone such as to produce an ethylene-monoolefin-copolymer having a density in the range of 0.915 to 0.935 g/cc

wherein said 1-butene, when used, is used in a concentration in mole percent in the gas phase on total olefins in the gas phase in the polymerization zone as 100 mole percent which is defined by the following formula

$$CGB = \frac{CPB}{K4}$$

wherein

CGB is the concentration of 1-butene in mole percent in the gas phase,

CPB is the concentration of 1-butene in the copolymer and

K4 is a factor in the range of 0.6 to 1.2;

wherein said 1-hexene, when used, is used in a concentration in mole percent in the gas phase based on total olefins in the gas phase in the polymerization zone as 100 mole percent which is defined by the following formula

$$CGH = \frac{CPH}{K6}$$

wherein

CGH is the concentration of 1-hexene in mole percent in the gas phase,

CPH is the concentration of 1-hexane in the copolymer and

K6 is a factor in the range of 1.4 to 2.5;

wherein said 1-octene, when used, is used in a concentration in mole percent in the gas phase based on total olefins in the gas phase in the polymerization zone as 100 mole percent which is defined by the following formula

$$CGO = \frac{CPO}{K8}$$

wherein

CGO is the concentration of 1-octene in mole percent in the phase phase,

CPO is the concentration of 1-octene in the copolymer and

K8 is a factor in the range of 4 to 7;

wherein said 4-methyl-1-pentene, when used, is used in a concentration in mole percent in the gas phase based on total olefins in the gas phase in the polymerization zone as 100 mole percent which is defined by the following formula

$$CGF = \frac{CPF}{K51}$$

wherein CGF is the concentration of 4-methyl-1-pentene in mole percent in the phase phase,

CPF is the concentration of 4-methyl-1-pentene in the copolymer and

K51 is a factor in the range of 1 to 1.4;

with the proviso that the higher values of the range of K4 or respectively K6 or respectively K8 or respectively K51 are associated with the lower densities and conversely wherein the lower values of these values K4, K6, K8 or K51 are associated with the higher densities of the copolymer produced.

4,522,988

METHOD OF PREPARING HIGH CIS-1,4 DIENE POLYMERS HAVING GOOD GREEN STRENGTH AND TACK

Jung W. Kang, Clinton, and James E. Hall, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 4, 1984, Ser. No. 616,767
Int. Cl.³ C08F *4/26*
U.S. Cl. 526—133 **16 Claims**

1. A method of preparing diene polymers having a high content of cis-1,4 addition and good green strength and tack comprising polymerizing a 1,3-diene monomer in a hydrocarbon solvent in the presence of a catalytically effective amount of a catalyst composition which comprises:

(a) a carboxylated metal oxy borate compound selected from the group consisting of compounds represented by the formulae $(RCOOMO)_3B$ and $(RCOOMO)_2BOR'$, wherein R and R' are alkyl radicals containing from 7 to 17 carbon atoms, and M is nickel or cobalt;

(b) an organometallic compound in which the metal is selected from Groups I, II, and III of the Periodic System; and

(c) one or more fluorine containing compounds selected from the group consisting of boron trifluoride complexes with ethers, alcohols or mixtures thereof; hydrogen fluoride; hydrogen fluoride complexes with ethers, alcohols or mixtures thereof and mixtures of said compounds.

4,522,989

METHOD OF PREPARING HIGH CIS-1,4 DIENE POLYMERS HAVING GOOD GREEN STRENGTH AND TACK USING A CATALYST COMPOSITION CONTAINING A CARBOXYLATED METAL OXY ALUMINATE COMPONENT

Jung W. Kang, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Ohio

Filed Jun. 4, 1984, Ser. No. 616,766
Int. Cl.³ C08F *4/26*
U.S. Cl. 526—133 **16 Claims**

1. A method of preparing diene polymers having a high content of cis-1,4 addition and good green strength and tack comprising polymerizing a 1,3-diene monomer in a hydrocarbon solvent in the presence of a catalytically effective amount of a catalyst composition which comprises:

(a) a carboxylated metal oxy aluminate compound selected from the group consisting of compounds represented by the formulae $(RCOOMO)_3AL$ and $(RCOOMO)_2ALOR'$, wherein R and R' are alkyl radicals containing from 7 to 17 carbon atoms, and M is nickel or cobalt;

(b) an organometallic compound in which the metal is selected from Groups I, II, and III of the Periodic System; and

(c) one or more fluorine containing compounds selected from the group consisting of boron trifluoride complexes with ethers, alcohols or mixtures thereof; hydrogen fluoride; hydrogen fluoride complexes with ethers, alcohols or mixtures thereof and mixtures of said compounds.

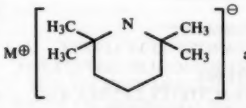
4,522,990

LIGHT STABLE POLYMERS BY ANIONIC POLYMERIZATION

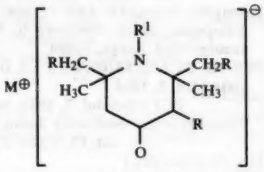
Gerald D. Andrews, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 369,937, Apr. 19, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 564,011
Int. Cl.³ C08F *4/48, 4/46*
U.S. Cl. 526—180 **4 Claims**

1. In an anionic polymerization process for polymerizing at least one anionically polymerizable monomer selected from the group consisting of alkyl methacrylates, fluoroalkyl methacrylates, alkoxyalkyl methacrylates, dialkylaminoalkyl methacrylates and alkadienyl methacrylates, the improvement consisting of using the initiator of the formula



and



wherein R is H or C_{1-4} alkyl, R' is H, C_{1-18} alkyl or C_{7-12} aralkyl, and M is alkali metal to produce a polymer having good light stability.

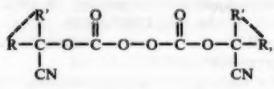
4,522,991

METHOD FOR POLYMERIZING ETHYLENICALLY UNSATURATED MONOMER WITH NOVEL ORGANIC PERCARBONATES

Robert H. Tang, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 430,167, Sep. 30, 1982, Pat. No. 4,492,656. This application Aug. 20, 1984, Ser. No. 642,304
Int. Cl.³ C08F *4/32*
U.S. Cl. 526—230.5 **6 Claims**

1. In the process of polymerizing ethylenically unsaturated monomer in the presence of an organic peroxydicarbonate initiator, the improvement wherein the initiator is an organic peroxydicarbonate of the graphic formula:



wherein R and R' are each selected from the group consisting of C_1–C_4 alkyl, C_5–C_7 cycloalkyl, and C_1–C_4 alkyl-substituted C_5–C_7 cycloalkyl, or participate in a cycloalkyl group of from 5 to 7 carbon atoms, provided that when one of R and R' is each individually a cycloalkyl group, the other is a C_1–C_4 alkyl.

4,522,992
AROMATIC MONOVINYL ALKENYL ALPHAOLEFIN ANHYDRIDE TERPOLYMERS

Calvin J. Verbrugge, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 28, 1983, Ser. No. 508,697
The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.
Int. Cl.³ C08F *222/04*
U.S. Cl. 526—272 **12 Claims**

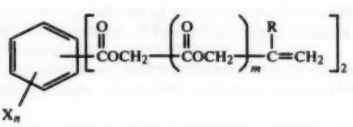
1. A terpolymer of from about 49 to 60 mole percent of a maleic anhydride, from about 20 to 40 mole percent of at least one aromatic mono-alkenyl monomer selected from the group consisting of styrene, alphamethyl styrene, vinyl toluene and mixtures thereof, and from about 40 to 20 mole percent of at least one 1-alkene having at least 18 carbon atoms.

4,522,993
RESIN FOR HIGH-REFRACTIVITY LENSES AND LENSES MADE OF SAME RESIN

Katsuyoshi Sasagawa; Akio Hyugaji, and Masao Imai, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP83/00218, § 371 Date Mar. 2, 1984, § 102(e) Date Mar. 2, 1984
PCT Filed Jul. 7, 1983, Ser. No. 592,826
Claims priority, application Japan, Jul. 8, 1982, 57-117821
Int. Cl.³ C08F *212/32*
U.S. Cl. 526—292.4 **18 Claims**

1. A resin for high-refractivity lenses, formed by copolymerizing 10 to 70 weight percent of at least one nucleus-halogenated benzene dicarboxylate having the following formula (I):



(I)

wherein X is a chlorine atom or a bromine atom, n is 2 or 4, m is 0 or 1 and R is a hydrogen atom or a methyl group, with 30 to 90 weight percent of at least one unifunctional monomer which has a refractive index of at least 1.55 as a homopolymer, is capable of undergoing a radical polymerization and contains an aromatic ring.

4,522,994
POLYPROPYLENE RESIN FOR HIGH-RIGIDITY MOLDED PRODUCTS

Hiromasa Chiba, Chibaken; Katsumi Kumahara, Ichiharashi; Takakiyo Harada, Ichiharashi; Takahiro Oka, Ichiharashi, and Akihiro Sato, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Dec. 15, 1982, Ser. No. 449,857
Claims priority, application Japan, Jul. 15, 1982, 57-123650
Int. Cl.³ C08F *10/06*
U.S. Cl. 526—351 **3 Claims**

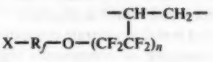
1. A polypropylene resin
(1) useful for high-rigidity molded products,
(2) having a melt flow rate of 0.1 to 100,
(3) having a density of 0.905 to 0.936 g/cm³
(4) having a boiling n-heptane insoluble part
(a) whose isotactic pentad ratio (P_o) is within the range of 0.975 to 0.995, and
(b) having a pentad ratio (P_2) having two different kinds of configurations is less than 0.002%, and
(5) having a melting point of 165° to 170° as measured by differential scanning calorimetry.

4,522,995
FLUORINATED ALKYL ETHER-CONTAINING ETHYLENES, PRECURSORS THERETO, AND COPOLYMERS THEREOF WITH TETRAFLUOROETHYLENE

Arthur W. Anderson; Fritschel Scott J., and Howard E. Holmquist, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1983, Ser. No. 490,880
Int. Cl.³ C08F *214/18, 214/26*
U.S. Cl. 526—243 **6 Claims**

1. A copolymer that is melt-processible, non-elastomeric, and is non-brittle in extruded form, which copolymer consists of 90–99.8 mol % tetrafluoroethylene units and 0.2–10 mol % of substituted ethylene units of the formula

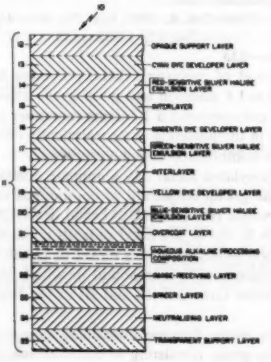


where n is 0 or 1; X is F—, FSO_2—, NC—, or $CF_3O(CF_2O)_m$— wherein m is 0, 1, 2 or 3; and R_f is a divalent moiety C_pF_{2p} wherein p is 2, 3, 4 or 5; said substituted ethylene units being randomly positioned throughout the copolymer chain.

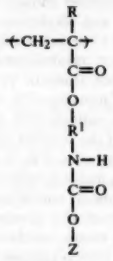
4,522,996
β-ELIMINATING POLYMERS FOR DIFFUSION CONTROL IN PHOTOGRAPHIC PRODUCTS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 454,448, Dec. 29, 1982, Pat. No. 4,458,001. This application Jun. 26, 1984, Ser. No. 624,826
Int. Cl.³ C08F *228/06, 226/02*
U.S. Cl. 526—256 **10 Claims**



1. A polymer comprising recurring units having the formula



wherein R is hydrogen, halogen or lower alkyl; R^1 is alkylene; and Z is an organic moiety capable under alkaline conditions of undergoing a β-elimination reaction, said moiety containing at least two interbonded carbon atoms, one of the carbon atoms containing an acid-labile proton capable of abstraction under said alkaline conditions and an activating group effective to activate said β-elimination reaction.

4,522,997

CROSSLINKING AGENTS FOR WATER-SWELLABLE POLYMERS

Hermann Schmitz, Frankfurt, and Klaus Kühlein, Kelkheim, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

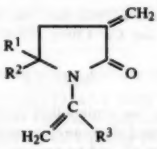
Filed Jun. 6, 1983, Ser. No. 501,537

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225555

Int. Cl.³ C08F *226/00*

U.S. Cl. 526—264 **7 Claims**

1. In the process for preparation of crosslinked, water-swellable polymers wherein an olefinic monomer or olefinic monomers are polymerized in the presence of a crosslinking agent at temperatures from 0° to 130° C., and the polymerization is initiated by high-energy radiation or chemical catalysts, the improvement comprises said crosslinking agent being 0.001 to 2% by weight, based on monomer to be polymerized, of a compound of the formula



wherein R^1, R^2 and R^3 are identical or different and each is hydrogen or alkyl having 1 to 6 carbon atoms.

4,522,998

INTERPOLYMER, PROCESS FOR ITS PREPARATION AND ADHESIVE OF IMPROVED CREEP RESISTANCE CONTAINING THE INTERPOLYMER

Manfred Heimberg, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,555

Int. Cl.³ C08F *32/04, 232/04*

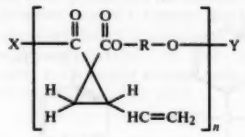
U.S. Cl. 526—309 **38 Claims**

1. An interpolymer derived from the interpolymerization of

(a) a vinyl ester;

(b) a lower alpha olefin; and

(c) a vinylcyclopropanedicarboxylate polyester oligomer or mixture thereof of the formula:



wherein R is a bivalent radical derived from a C_{2-12} aliphatic diol, C_{3-12} cycloaliphatic diol, C_{8-10} aromatic diol or ether diol having from about 4 to about 60 carbon atoms and about 1 to about 30 ether moieties, n is an integer from about 1 to about 20 and X and Y are terminating groups.

4,522,999

VINYLCYCLOPROPANE DICARBOXYLATE POLYESTER OLIGOMER INTERPOLYMER, PROCESS FOR ITS PREPARATION AND SEMI-GLOSS LATEX PAINT OF IMPROVED WET ADHESION CONTAINING THE INTERPOLYMER

Manfred Heimberg, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,556

Int. Cl.³ C08F *32/04, 232/04*

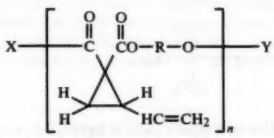
U.S. Cl. 526—309 **44 Claims**

1. An interpolymer derived from the interpolymerization of

(a) a vinyl ester of an alpha-unbranched saturated monocarboxylic acid;

(b) a monomer selected from the group consisting of an alkyl ester of an alpha, beta ethylenically unsaturated monocarboxylic acid and a vinyl ester of an alpha-branched saturated monocarboxylic acid; and

(c) a vinylcyclopropanedicarboxylate polyester oligomer or mixture thereof of the formula:



wherein R is a bivalent radical derived from a C_{2-12} aliphatic diol, C_{3-12} cycloaliphatic diol, C_{8-10} aromatic diol or ether diol having from about 4 to about 60 carbon atoms and about 1 to about 30 ether moieties, n is an integer from about 1 to about 20 and X and Y are terminating groups.

4,523,000

COPOLYMERS, PROCESS FOR THE PREPARATION THEREOF AND IONIZING RADIATION SENSITIVE RESIST USING SUCH COPOLYMERS

Koichi Hatada, Ikeda; Yoshio Okamoto, Amagasaki, and Tatsuki Kitayama, Higashiosaka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

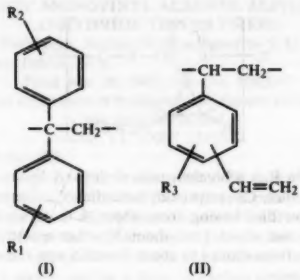
Filed Oct. 28, 1983, Ser. No. 546,337

Claims priority, application Japan, Nov. 2, 1982, 57-193068; Dec. 1, 1982, 57-210830

Int. Cl.³ C08F *212/36*

U.S. Cl. 526—336 **32 Claims**

1. A solvent-soluble copolymer having a number average molecular weight of about 1,000 to about 1,000,000 and comprising recurring units represented by the following formulae (I) and (II), said recurring units being combined to form the main alkylene chain, in which the amount of the formula (I) unit is about 3 to about 60 mol % of the total amount of the units of the formulae (I) and (II):



(I) (II)

wherein each of R_1, R_2 and R_3 represents independently hydrogen, a straight or branched chain alkyl group having 1 to 4 carbon atoms or a halogen.

4,523,001

SCAVENGERS FOR ONE COMPONENT ALKOXY-FUNCTIONAL RTV COMPOSITIONS

Roger T. Swiger, Schenectady, and John E. Hallgren, Scotia, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

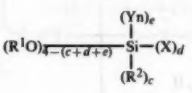
Filed Mar. 17, 1983, Ser. No. 476,000
Int. Cl.[3] C08L *83/04*; C08G *77/26, 77/04*
U.S. Cl. 528—18 **37 Claims**

1. A stable, one package, substantially anhydrous and substantially acid-free room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer comprising:

(A) a silanol-terminated organosiloxane base polymer;

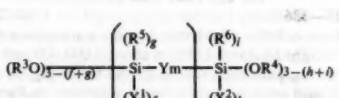
(B) an effective amount of condensation catalyst;

(C) a stabilizing amount of scavenger for hydroxy functional groups having the general formula



(i)

where R^1 is an aliphatic radical having 1 to 8 carbon atoms and is selected from the group consisting of alkyl radicals, alkylether radicals, alkylester radicals, alkylketone radicals and alkylcyano radicals or an aralkyl radical having 7 to 13 carbon atoms; R^2 is a monovalent substituted or unsubstituted hydrocarbon radical having 1 to 13 carbon atoms; X is a hydrolyzable leaving group selected from the group consisting of amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido radicals; Y is selected from the group consisting of moieties of Si, O, S, N, P, C, B, Sn, Pb, Ca, hydrazine, azo radicals, CO, CO_2, organic peroxides and metal oxides of the formula AO_z where A is selected from the group consisting of B, S, Sn, P, Al, Ti, V, Tl, Ir, Pb, Pt, Pd and Fe and where z is sufficient to satisfy chemical valence requirements; where C is attached to at least one other Y moiety; c is an integer equal to 0 to 1; d is an integer equal to 1 or 2; e is an integer equal to 1 or 2; the sum of c+d+e equals 2 or 3; n equals at least 1; or



(ii)

where R^3 and R^4 are aliphatic radicals having 1 to 8 carbon atoms and are selected from the group consisting of alkyl radicals, alkylether radials, alkylester radicals, alkylketone radicals and alkylcyano radicals or an aralkyl radical having 7 to 13 carbon atoms; R^5 and R^6 are monovalent substituted or unsubstituted hydrocarbon radicals having 1 to 13 carbon atoms or Yn; Y is selected from the group consisting of moieties of Si, O, S, N, P, C, B, Sn, Pb, Ca, hydrazine, azo radicals, CO, CO_2, organic peroxides and metal oxides of the formula AO_z where A is selected from the group consisting of B, S, Sn, P, Al, Ti, V, Tl, Ir, Pb, Pt, Pd and Fe, and z is sufficient to satisfy chemical valence requirements; X^1 and X^2 are hydrolyzable leaving groups selected from the group consisting of amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido radicals; f is an integer equal to 0 to 2 inclusive; g is an integer equal to 0 to 2 inclusive; h is an integer equal to 0 to 3 inclusive; i is an integer equal to 0 to 3 inclusive; the sum of f+g equals 0 to 2 inclusive; the sum of h+f equals at least 1; the sum of h+i equals 0 to 3 inclusive; m is equal to 0 or more and r is equal to at least 1; or

(iii) a cyclic compound with at least one silicon atom as a member of the ring, said silicon atom having attached thereto a hydrolyzable leaving group selected from the group consisting of amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido radicals; and wherein at least 1 of said silicon atoms has attached thereto an alkoxy radical having an aliphatic group of 1 to 8 carbon atoms selected from the group consisting of alkyl radicals, alkylether radicals, alkylester radicals, alkylketone radicals, and alkylcyano radicals or an aralkyl radical having 7 to 13 carbon atoms, and wherein the total number of hydrolyzable groups is at least three, or

(iv) mixtures of (i) and (ii) and (iii); and where the hydrolyzable group is enoxy

(D) an effective amount of curing accelerator selected from the group consisting of substituted guanidines, amines and mixtures thereof.

4,523,002

IONICALLY CROSS-LINKED SILOXANE POLYMERS

John R. Campbell, Clifton Park, and Robert E. Williams, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,166
Int. Cl.[3] C08G *77/04*
U.S. Cl. 528—26 **7 Claims**

1. A method of producing zwitterionic siloxane polymers comprising

a. copolymerizing an aminoalkyl-trialkoxy-silane with a hydroxy-endcapped siloxane oligomer in the presence of a catalytic quantity of acid to provide an aminoalkyl-siloxane polymer intermediate; and

b. reacting said aminoalkyl siloxane polymer intermediate with a member from the group consisting of organo-lactones and organo-sultones in the presence of a solvent.

4,523,003

STORAGE STABLE, ONE PACKAGE, HEAT CURABLE POLYUREA/URETHANE COATING COMPOSITIONS AND METHOD OF PREPARATION

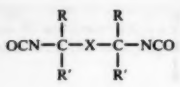
Rao S. Bezwada, Whitehouse Station, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 4, 1984, Ser. No. 568,160
Int. Cl.[3] C08G *18/24, 18/32*; B05D *3/02, 3/00*
U.S. Cl. 528—58 **11 Claims**

1. A one package, storage stable heat-curable poly urea/urethane coating composition, said composition comprising:

(a) a mixture or a prepolymer of

(i) a poly aliphatic isocyanate compound of the formula:



wherein R and R′ are each, independently, selected from hydrogen, alkyl or substituted alkyl and X is a bridging means selected from divalent aliphatic, cycloaliphatic or aromatic groups, or a polymeric adduct of said aliphatic isocyanate said polymeric adduct possessing polyaliphatic isocyanate functionality; and

(ii) at least one monomeric or polymeric compound containing a plurality of isocyanate-reactive hydrogens, wherein the molar ratio of the total isocyanate groups in (i) to the total reactive hydrogens in (ii) is from about 1:0.8 to about 1:1.2, respectively; and

(b) a minor effective amount of a polymerization catalyst.

4,523,004

DIAMINE/DIOL CHAIN EXTENDER BLENDS FOR RIM PROCESS

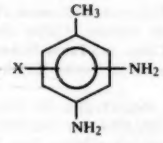
I. Sioun Lin, Oak Ridge; Stanley J. Gromelski, Jr., West Caldwell, both of N.J.; Jesse Werner, New York, N.Y.; Michael J. Brown, Randolph Township, Morris County, N.J., and Paritosh M. Chakrabarti, Pittsburgh, Pa., assignors to GAF Corporation, Wayne, N.J.

Filed Jun. 23, 1983, Ser. No. 506,250

Int. Cl.³ C08G *18/32, 18/14;* B29H *7/20*

U.S. Cl. 528—76 **5 Claims**

1. A normally liquid polymer chain extender blend of butanediol and a mono-substituted toluene diamine mono-substituted with an electron-withdrawing group and having the formula



wherein X is vicinal to an amino radical and is selected from the group of halo, CN, NO_2, acyl, carboxylate and isomeric mixtures thereof, said blend having a mole ratio of from 4:1 to about 19:1 butanediol to said diamine.

4,523,005

EXTRUDABLE POLYURETHANE FOR PROSTHETIC DEVICES PREPARED FROM A DIISOCYANATE, A POLYTETRAMETHYLENE ETHER POLYOL, AND 1,4-BUTANE DIOL

Michael Szycher, Lynnfield, Mass., assignor to Thermedics, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 479,922, Apr. 4, 1983, Pat. No. 4,447,590, which is a continuation of Ser. No. 316,922, Oct. 30, 1981, abandoned. This application Apr. 17, 1984, Ser. No. 600,568

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.³ C08G *18/30*

U.S. Cl. 528—76 **4 Claims**

1. A polymer for use in extruding and molding devices requiring a high degree of blood compatibility, said polymer consisting essentially of a polyurethane elastomer which is the reaction product of:

(a) dicyclohexyl methane diisocyanate;

(b) a polytetramethylene ether polyol having a molecular weight in the range of 1000–3000; and

(c) 1,4 butane diol,

wherein the number of moles of dicylohexyl methane diisocyanate molecules is equal to the sum of the number of moles of polytetramethylene ether polyol and the number of moles of 1,4 butane diol; the molar ratio of 1,4 butane diol to polytetramethylene ether glycol is between 1.1 to 0.9 and 1.5 to 0.5; and the average molecular weight of the polymer is 120,000–180,000 units, and a weight average molecular weight of 285,000–335,000 molecular weight units.

4,523,006

POLYETHERIMIDES OF DI(PHTHALIC ANHYDRIDE) DERIVATIVES OF DI(SUBSTITUTED PHENOL) SULFONES

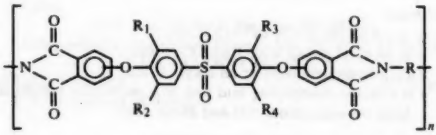
Edward N. Peters, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 1, 1983, Ser. No. 462,921

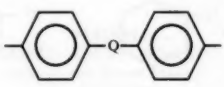
Int. Cl.³ C08G *73/10*

U.S. Cl. 528—172 **3 Claims**

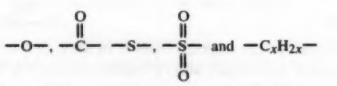
1. A polyetherimide of the formula



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of lower alkyl of from 1 to about 10 carbon atoms; aryl of from 6 to about 15 carbon atoms; aralkyl, wherein the alkyl portion contains from 1 to about 5 carbon atoms and the aryl portion contains from 6 to about 10 carbon atoms; halogen; lower alkoxy of from 1 to about 10 carbon atoms; and aryloxy of from 6 to about 15 carbon atoms and n is an integer from 10 to about 10,000 and R is a divalent organic radical selected from the class consisting of (a) aromatic hydrogen radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2 to about 20 carbon atoms $C_{(2-8)}$ alkylene terminated polydiorganosiloxanes; and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of:



where x is a whole number from 1 to 5 inclusive.

4,523,007

CROSSLINKING COMPONENT FOR PAINT BINDERS AND PROCESS FOR PRODUCING SUCH COMPONENTS FROM A CARBONYL COMPOUND

Rudolf Schipfer, and Gerhard Schmölzer, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jul. 9, 1984, Ser. No. 628,844

Claims priority, application Austria, Jul. 11, 1983, 2531/83

Int. Cl.³ C08G *2/18, 16/00*

U.S. Cl. 528—227 **9 Claims**

1. Process for producing hardener components for paint binders which will crosslink through transesterification, characterized in that a compound of the structure

$X—CH_2—COOR$

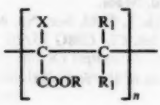
wherein

X is —COOR, —CN or $—COCH_3$ and

R is an alkyl group with from 1 to 8 C-atoms

is reacted in a KNOEVENAGEL-reaction with a carbonyl compound, water being split off, and the resulting α-disubstituted alkylidene compound thereafter polymerized to a polymeric compound having a molecular weight of from between about 300 and about 6000.

7. Crosslinking component for paint binders crosslinkable through transesterification, having the general formula



wherein

X is —COOR, —CN or $—COCH_3$,

R is an alkyl group with 1 to 8 C-atoms,

R_1 is a hydrogen atom or an alkyl radical,

n is a factor multiplying said unit to a molecular weight of from between about 300 and about 6000.

4,523,008

STABILIZED UNSATURATED POLYESTERS

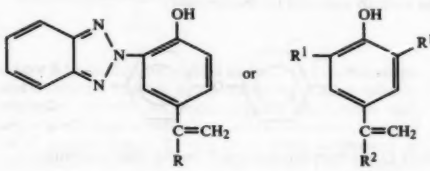
Otto Vogl, New Rochelle, N.Y., and Eberhard Borsig, Bratislava, Czechoslovakia, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 6, 1984, Ser. No. 617,871

Int. Cl.³ C08G *63/20, 63/44*

U.S. Cl. 528—288 **10 Claims**

1. An unsaturated polyester polymer comprising an unsaturated polyester prepolymer interpolymerized with at least one stabilizer selected from the group consisting of:



(I) (II)

where R and R^2 are selected from H or alkyl of 1 to 6 carbon atoms and R^1 is a tertiary alkyl group containing 3 to 12 carbon atoms.

4,523,009

POLYPHOSPHAZENE COMPOUNDS AND METHOD OF PREPARATION

Robert H. Neilson, and Patty J. Wisian-Neilson, both of 6513 Lawndale Dr., Fort Worth, Tex. 76134

Continuation of Ser. No. 519,040, Aug. 1, 1983, abandoned, which is a division of Ser. No. 341,689, Jan. 22, 1982, Pat. No. 4,412,053, which is a continuation of Ser. No. 232,518, Feb. 9, 1981, abandoned. This application Jul. 31, 1984, Ser. No. 636,076

Int. Cl.³ C08G *73/00*

U.S. Cl. 528—399 **4 Claims**

1. A linear non cross-linked phosphazene polymer, having the formula:

wherein

R is an alkyl group containing 1 to 5 carbon atoms and wherein R′ is selected from the group consisting of alkyl, aryl, and lower alkyl-substituted aryl groups, said alkyl groups containing 1 to 5 carbon atoms, and said aryl and alkyl-substituted aryl groups having 6 to 10 carbon atoms;

n is greater than about 175; and

wherein both R and R′ are bonded to phosphorus atoms by direct carbon to phosphorus bonds.

4,523,010

DIHYDROXYPROPYL MIXED ETHER DERIVATIVES OF CELLULOSE

Carl Lukach, New Castle County, Del.; Thomas G. Majewicz, Chadds Ford, Pa., and Albert R. Reid, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jun. 15, 1984, Ser. No. 621,328

Int. Cl.³ C08B *11/193*

U.S. Cl. 536—91 **8 Claims**

1. A nonionic, crosslinkable material consisting essentially of dihydroxypropyl hydroxyalkylcellulose having a dihydroxypropyl M.S. of from about 0.1 to 1.2 and a hydroxyalkyl M.S. of from about 1.5 to about 3.0.

4,523,011

PROCESS FOR PREPARING 6-(SUBSTITUTED PHENYL)-4,5-DIHYDRO-3(2H)-PYRIDAZINONE COMPOUNDS

Tsutomu Katakami; Nobuyuki Fukazawa; Hajime Iizuka, all of Kanagawa; Takashi Nishina, Chiba; Joji Kamiya, Chiba; Yasuhito Tanaka, Chiba, and Takuo Nakano, Kanagawa, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

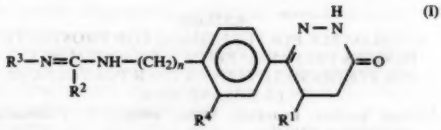
Division of Ser. No. 454,021, Dec. 28, 1982,. This application Mar. 28, 1984, Ser. No. 594,303

Claims priority, application Japan, Dec. 28, 1981, 56-209938

Int. Cl.³ C07D *237/04;* **A61K** *31/50*

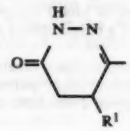
U.S. Cl. 544—238 **12 Claims**

1. A process for the preparation of a 6-(substituted phenyl)-4,5-dihydro-3(2H)-pyridazinone compound of the formula:



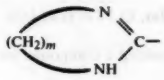
(I)

wherein R^1 is a hydrogen atom or a lower alkyl group; R^2 is a hydrogen atom, a lower alkyl group, a lower alkylthio group or the grouping R^5-NH—where R^5 is a lower alkyl group; R^3 is a phenyl group, a pyridyl group, a benzyl group, a lower alkyl group or a substituted phenyl group carrying at the para-position (4-position) on the benzene ring thereof the grouping:

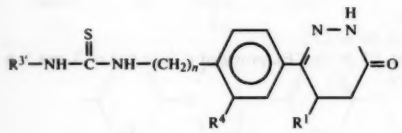


wherein R^1 has the same meaning as given above; R^4 is a hydrogen atom or a halogen atom; n is 0 or 1; and when both R^2 and R^3 are lower alkyl groups, R^2 an R^3 may be combined together with the bridging member

between them to form the structure:

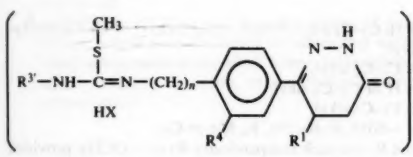


wherein m is 2 or 3, or a physiologically acceptable acid-addition salt thereof, which comprises reacting a 6-(3-R^4-4-amino- or 3-R^4-4-aminoalkyl-phenyl)-4,5-dihydro-3(2H)-pyridazinone with a thioisocyanate of the formula $R^{3'}$-NCS where $R^{3'}$ is a phenyl, pyridyl or benzyl group or a lower alkyl group to form a thiourea derivative of the formula:



(II)

wherein R^1, $R^{3'}$, R^4 and n have the same meanings as given above, reacting the thiourea derivative with a methyl halide to prepare the corresponding methylisothiuronium salt of the formula:



(II')

wherein X is a halogen atom and R^1, $R^{3'}$, R^4 and n have the same meanings as given above, and then reacting the methylisothiuronium salt with an amine or diamine of the formula:

$$R{-}NH_2 \text{ or } H_2N{-}(CH_2)_m{-}NH_2$$

wherein R is a pyridyl, benzyl or phenyl group or a lower alkyl group and m is 2 or 3.

4,523,012

S-SUBSTITUTED 2-AZIDO-3-MERCAPTO-PROPIONIC ACID ESTER AND PROCESS FOR ITS PRODUCTION AND USE

Franz Effenberger, and Thomas Beisswenger, both of Stuttgart, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 418,843, Sep. 16, 1982, Pat. No. 4,456,766. This application Jan. 12, 1983, Ser. No. 457,391

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3200994

Int. Cl.³ C07C *149/243*

U.S. Cl. 544—316 **9 Claims**

1. An S-substituted 2-azido-3-mercapto-propionic acid ester of the formula:

(I)

where R^1 is a methyl or ethyl group and R^2 is an alkyl group of 1 to 8 carbon atoms, a mercapto lower alkyl group, a carboxyalkyl group having 2 to 3 carbon atoms, a lower alkyl oxycarbonyl 1-2 carbon atom alkyl group, a cyclopentyl group, a cyclohexyl group, a phenyl group, a halophenyl group, a lower alkyl phenyl group, a pyrimidyl group, or a benzyl group.

4,523,013

4-ACYL-2,6-DIOXO-1-PHENETHYL PIPEROZINES

Daniel Fréhel, Toulouse, and Jean-Pierre Maffrand, Portet-sur-Garonne, both of France, assignors to Sanofi, S.A., Toulouse, France

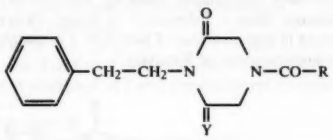
Filed Jan. 31, 1983, Ser. No. 462,397

Claims priority, application France, Jan. 29, 1982, 82 01758

Int. Cl.³ C07D *241/08*

U.S. Cl. 544—385 **6 Claims**

1. A compound of formula



in which Y represents O or H, OH and R represents a lower alkyl group, cycloalkyl having 3 to 8 carbon atoms, phenyl or phenyl which is mono- or disubstituted with a member selected from the group consisting of halogen, hydroxy, monoloweralkyl amino, diloweralkyl amino, mercapto, thioalkyl, cyano, trifluoromethoxy, and trifluoromethylthio.

4,523,014

PIPERAZINES 1-HEXYL-4(3-KETOHEXYL)

Bernard Loev, Scarsdale, and Ernest Magnien, Flushing, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,588

Int. Cl.³ C07D *241/04*; A61K *31/495*

U.S. Cl. 544—386 **4 Claims**

1. 1-Hexyl-4-(3-ketohexyl)piperazine.
2. 1-Hexyl-4-(2-ethyl-3-ketohexyl)piperazine.

4,523,015

PROCESS AND NITROAMINOPYRIMIDONE INTERMEDIATES FOR HISTAMINE H_2-ANTAGONISTS

Thomas H. Brown, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

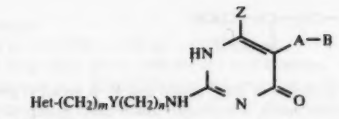
Division of Ser. No. 27,543, Apr. 6, 1979, Pat. No. 4,227,000. This application May 19, 1980, Ser. No. 151,502

Claims priority, application United Kingdom, Apr. 11, 1978, 14049/78

Int. Cl.³ C07D *401.12*

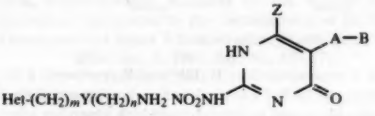
U.S. Cl. 544—320 **10 Claims**

1. A process for preparing a 2-aminopyrimidone of Structure 1



(1)

in which Het is a nitrogen-containing 5- or 6-membered fully unsaturated heterocyclic group selected from imidazolyl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl and thiadiazolyl which is optionally substituted by lower alkyl, trifluoromethyl, halogen, hydroxy, lower alkoxy or amino, m is 0 or 1, Y is methylene, oxygen or sulphur; n is 2 or 3; Z is hydrogen or lower alkyl; A is C_1–C_5 alkylene or $-(CH_2)_p-W(CH_2)_q-$ where W is oxygen or sulphur and the sum of p and q is 1 to 4; and B is hydrogen, methyl, C_3–C_6 cycloalkyl, a heteroaryl group selected from pyridyl, furyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, imidazolyl, pyrimidyl, pyrazinyl, pyridazyl, thiadiazolyl, quinolyl, isoquinolyl, 5,6,7,8-tetrahydroquinolyl, 1,3-dioxolopyridyl, benzimidazolyl and benzthiazolyl optionally substituted by lower alkyl or lower alkoxy, or B is a napthyl, 5- or 6- (2,3-dihydro-1,4-benzodioxinyl), or a 4- or 5- (1,3-benzodioxolyl) group, or a phenyl group optionally substituted with lower alkyl, lower alkoxy, halogen, aryl(lower alkoxy), hydroxy, lower alkoxy-lower alkoxy, trifluoromethyl, di(lower alkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl; characterised in that an amine of Structure 2 is reacted with a 2-nitroaminopyrimidone of Structure 3.



(3)

4,523,016

PROCESS FOR THE CATALYTIC DEHYDROGENATION OF PIPERIDINE

Georg Grigoleit, Dorsten; Rudolf Oberkobusch, Duisburg; Jürgen Stadelhofer, Dortmund, and Kurt Matern, Duisburg, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 13, 1983, Ser. No. 513,197

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227022

Int. Cl.³ C07D *213/02*

U.S. Cl. 546—252 **6 Claims**

1. A process for the catalytic dehydrogenation of piperidine to pyridine in the gas phase using hydrogen as the carrier gas, which comprises contacting piperidine in the presence of hydrogen in a reaction zone with a catalyst comprising silicon dioxide activated with copper, nickel and chromium as the catalyst, the activating metals copper, nickel and chromium being present in an amount of 5–12:1–5:0.2–0.7 parts by weight per 100 parts by weight of catalyst, the hydrogen/piperidine molar ratio is 5:1, and carrying out the dehydrogenation reaction in the temperature range from 345° to 380° C., and thereafter separating and recovering the pyridine.

4,523,017

PREPARATION OF TRIFLUOROMETHYL PYRIDINYLOXYPHENOXY PROPANOIC ACIDS AND PROPANOLS AND DERIVATIVES THEREOF

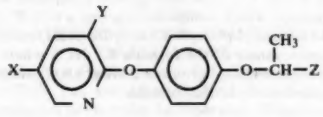
Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 357,346, Mar. 11, 1982, abandoned, which is a continuation of Ser. No. 918,550, Jun. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 817,943, Jul. 22, 1977, abandoned. This application Sep. 2, 1983, Ser. No. 529,178

Int. Cl.³ C07D *213/64*

U.S. Cl. 546—302 **9 Claims**

5. A process for making a compound having the formula

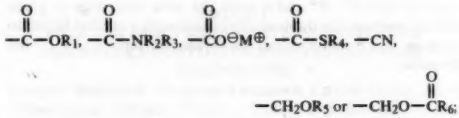


wherein

X is Cl, Br or CF_3;

Y is H, Cl, Br or CF_3, provided at least one of X and Y is CF_3;

Z is



R_1 is H, C_1–C_8 alkyl, benzyl, chlorobenzyl or C_3–C_6 alkoxyalkyl;

R_4 is C_1–C_4 alkyl;

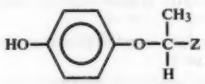
R_5 is H or C_1–C_4 alkyl;

R_6 is C_1–C_7 alkyl;

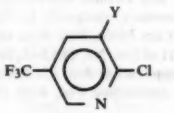
M is $-NHR_2R_3R_7$, Na, K, Mg or Ca;

R_2 and R_3 are each independently R_7 or $-OCH_3$, provided both R_2 and R_3 cannot simultaneously be OCH_3 and neither is $-OCH_3$ in $-NHR_2R_3R_7$; and

R_7 is H, C_1–C_4 alkyl or C_2–C_3 hydroxyalkyl, which comprises reacting a compound having the formula



wherein Z is as above defined, with a compound having the formula



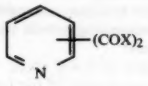
where Y is as above defined, in an inert solvent in the presence of aqueous sodium hydroxide while agitating and heating.

4,523,018
CERTAIN BIS(BENZOYL)PYRIDINE COMPOUNDS

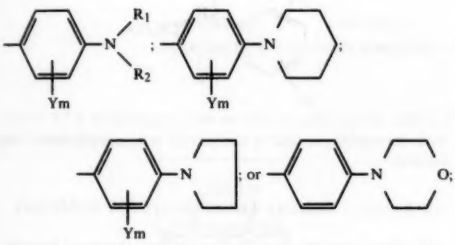
Yojiro Kumagae, Osaka, and Yasuhisa Iwasaki, Nara, both of Japan, assignors to Yamamoto Kagaku Gosei Co., Ltd., Osaka, Japan

Filed Oct. 21, 1982, Ser. No. 435,805
Claims priority, application Japan, Nov. 10, 1981, 56-178992
Int. Cl.³ C07D *213/50, 401/02*
U.S. Cl. 546—315 18 Claims

1. A compound represented by the formula:



wherein X is:



Y is: lower alkyl, lower alkoxy, phenyl, benzyl,, which is unsubstituted or substituted with lower alkyl, halogenated lower alkyl, lower dialkylamino, lower alkoxy, halogen or cyano, or is lower dialkylamino or halo; m is: an integer of 0 to 4; and

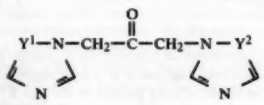
R_1 and R_2 are: alkyl of 1 to 8 carbon atoms, of phenyl or benzyl, which is unsubstituted or substituted with lower alkyl, halogenated lower alkyl, lower dialkyamino, lower alkoxy, halogen or cyano, or are cycloalkyl of 5 to 6 carbon atoms.

4,523,019
1,3-BIS(TRIAZOLYL)PROPAN-2-ONE

Paul A. Worthington, Maidenhead, England, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 269,581, Jun. 2, 1981, Pat. No. 4,416,682. This application Sep. 12, 1983, Ser. No. 531,244
Claims priority, application United Kingdom, Jun. 2, 1980, 8017959; Mar. 30, 1981, 8109923
Int. Cl.³ C07D *249/08*
U.S. Cl. 548—262 1 Claim

1. A compound of the formula (V)



(V)

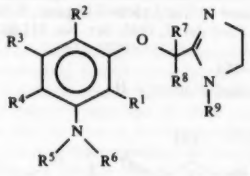
wherein Y^1 and Y^2 are =N—.

4,523,020
SUBSTITUTED 2-(3-AMINOPHENOXYMETHYL)IMIDAZOLINES

Alan E. Moormann; Barnett S. Pitzele, both of Skokie, and Peter H. Jones, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 10, 1983, Ser. No. 550,334
Int. Cl.³ C07D *233/22*
U.S. Cl. 548—353 13 Claims

1. A compound of the formula:



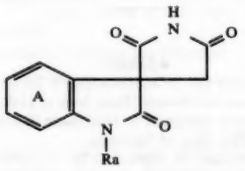
wherein R^1 and R^3, each being the same or different, are:
(a) hydrogen; or
(b) alkyl or 1 to 6 carbon atoms, inclusive;
wherein R^2 and R^4, each being the same or different, are:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive; with the proviso that R^1 and R^2 may not both be hydrogen;
wherein R^5 is hydrogen;
wherein R^6 is:
(a) alkanoyl of 2 to 7 carbon atoms, inclusive; or
(b) alkoxycarbonyl of 2 to 7 carbon atoms, inclusive;
wherein R^7 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R^8 is alkyl of 1 to 6 carbon atoms, inclusive;
wherein R^9 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
or a pharmacologically acceptable salt; the compound being either hydrated or unhydrated.

4,523,021
1'-SUBSTITUTED-SPIRO[PYRROLIDINE-3,3'-INDOLINE]-2,2',5-TRIONES

David R. Brittain, Macclesfield, and Robin Wood, Hazel Grove, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 377,135, May 11, 1982, Pat. No. 4,478,847. This application Aug. 7, 1984, Ser. No. 638,500
Claims priority, application United Kingdom, May 12, 1981, 8114397
Int. Cl.³ C07D *209/96*
U.S. Cl. 548—410 5 Claims

1. A 1'-substituted-spiro(pyrrolidine-3,3'-indoline)-2,2',5-trione of the formula:



I

wherein Ra is benzyl bearing two independently selected halogeno substituents located at positions 2 and 4, or 3 and 4, or is benzyl bearing a bromo or trifluoromethyl substituent located at position 3 or 4; and benzene ring A is unsubstituted or bears one or two substituents independently selected from

halogeno, (1–4C)alkyl, trifluoromethyl and nitro; or a salt thereof with a base affording a pharmaceutically acceptable cation; or the non-toxic, biodegradable 1-pivaloyloxymethyl precursor thereof.

4,523,022

ANALOGS OF THE ANTIBIOTIC SPECTINOMYCIN

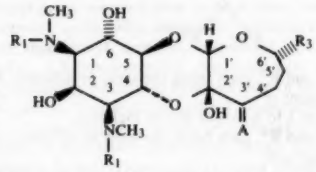
Richard C. Thomas, Oshtemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 7, 1983, Ser. No. 511,802

Int. Cl.³ C07D *313/02*

U.S. Cl. 549—354 **7 Claims**

1. A compound of formula II



II

wherein

R_1 is

(a) hydrogen or

(b) a blocking group; and

wherein

R_3 is

(a) hydrogen

(b) alkyl of 1 to 8 carbon atoms, inclusive,

(c) $—R_{31}—O—R_{32}$, wherein R_{31} is alkylene of 1 to 4 carbon atoms, inclusive, and R_{32} is hydrogen or alkyl of 1 to 6 carbon atoms, inclusive, with the proviso that the sum of the number of carbon atoms in R_{31} and the number of carbon atoms in R_{32} is less than or equal to 7,

(d) $—R_{31}NR_{33}R_{34}$, wherein R_{31} is as defined above, wherein R_{33} is hydrogen, alkyl of 1 to 6 carbon atoms, inclusive, and R_{34} is hydrogen, alkyl of 1 to 6 carbon atoms, inclusive, or a blocking group with the proviso that if R_{34} is not a blocking group, the sum of the number of carbon atoms in R_{31} and the number of carbon atoms in whichever of R_{33} or R_{34} has the larger number of carbon atoms is less than or equal to 7, or

(e) alkyl of 1 to 4 carbon atoms, inclusive, substituted with 1, 2 or 3 halogen atoms;

wherein

A is

(a) =O or

(b) α-H:β-OH; α-OH:β-H; and pharmacologically acceptable salts thereof.

4,523,023

PREPARATION OF ISOCHROMANE DERIVATIVES

Horst Finkelmeier, and Rudolf Hopp, both of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

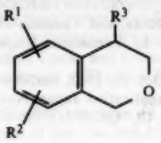
Filed Jan. 31, 1984, Ser. No. 575,439

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306200

Int. Cl.³ C07D *311/78, 311/02*

U.S. Cl. 549—385 **6 Claims**

1. A process for the preparation of an isochromane of the formula

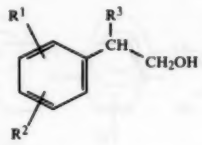


in which

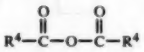
R^1 and R^2 are identical or different and denote hydrogen, lower alkyl or lower alkoxy, or together form a cyclopentane or cyclohexane ring which is optionally substituted by lower alkyl and

R^3 denotes hydrogen or lower alkyl,

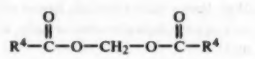
comprising reacting an alcohol of the formula



with formaldehyde and a carboxylic acid anhydride of the formula



or with a methylene diester of the formula



in which

R^4 represents a lower alkyl radical, in the presence of an acid catalyst.

4,523,024

3,4-DIHYDRO-2H-BENZOPYRAN DERIVATIVES, A METHOD OF PRODUCING THEM, A METHOD OF USING THEM AS STABILIZERS FOR ORGANIC MATERIALS, AND ORGANIC COMPOSITIONS CONTAINING SUCH STABILIZERS

Manzo Shiono; Yoshiji Fujita, and Takashi Nishida, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

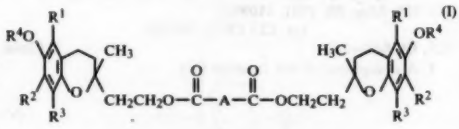
Filed Nov. 15, 1983, Ser. No. 552,068

Claims priority, application Japan, Nov. 26, 1982, 57-208252; Dec. 27, 1982, 57-229693; Mar. 3, 1983, 58-35599; Apr. 1, 1983, 58-58179; Oct. 14, 1983, 58-193179

Int. Cl.³ C07D *311/72*

U.S. Cl. 549—407 **22 Claims**

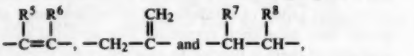
1. A compound of the general formula (I)



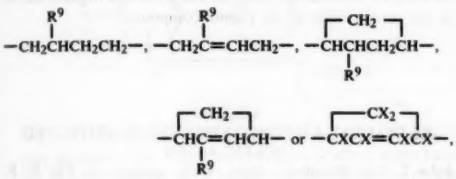
(I)

wherein R^1 is a hydrogen atom or a lower alkyl group; R^2 and R^3 are the same or different and each is a hydrogen atom, a lower alkyl group or a lower alkoxy group, or R^2 and R^3 taken together represent a group of the formula —CH=CH—CH=CH—; R^4 is a hydrogen atom or a hydroxy-protecting group;

A is a group selected from the class consisting of $-(CH_2)_n$, phenylene, $-CH_2SCH_2-$, $-CH_2CH_2SCH_2-$, $-CH_2CH_2SCH_2CH_2-$, $-CH_2S-SCH_2-$, $-CH_2CH_2S-SCH_2CH_2-$, $-CH_2SCH_2SCH_2-$, $-CH_2CH_2SCH_2SCH_2CH_2-$,



where n is an integer equal to 1 to 14; R^5 and R^6 are the same or different and each is a hydrogen atom or a lower alkyl group, or R^5 and R^6 taken together represent a group of $-(CH_2)_4-$; R^7 and R^8 taken together represent



where R^9 is a hydrogen atom or a lower alkyl group and X is a halogen atom.

4,523,025

POLYMER POLYOLS FROM PARTIALLY REACTED POLYAMINES

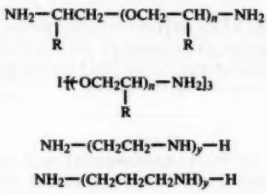
Michael Cuscurida, and Howard P. Klein, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,200
Int. Cl.³ C07C *125/077*
U.S. Cl. 560—26 **5 Claims**

1. A polymer polyol made by the process comprising

a. reacting

(1) a compound selected from the group consisting of compounds of the formulae



where R is an alkyl group of from 1 to 4 carbon atoms, n ranges from 1 to 35, y ranges from 1 to 5 and where I is a trifunctional initiator selected from the group consisting of glycerine, trimethylolpropane and triethanolamine with

(2) a compound selected from the group consisting of alkylene oxides having 2 to 8 carbon atoms

to give an adduct where the tertiary amine content of the resulting adduct is less than 90%, and

b. subsequently reacting

(1) the adduct from step a. with

(2) An organic polyisocyanate selected from the group consisting of toluene diisocyanate, diphenylmethane diisocyanate, isophorone diisocyanate and methylene biscyclohexylisocyanate in the presence of

(3) a polyether polyol solvent having a molecular weight of about 3,000 to 8,000 a hydroxyl number between about 20 and 60 and a hydroxyl functionality of from about 2 to about 4

such that the ratio of equivalents of the adduct to equivalents of polyisocyanate is from about 1:1 to 2:1 and the combined weight of the adduct and the polyisocyanate is about 5 to 25 wt% of the polyether polyol solvent.

4,523,026

SYNTHESIS OF N-BENZYLOXYCARBONYL-L-ASPARTIC ACID

K. Ming Wan, East Brunswick; Mary S. Chen, Edison, and Anil D. Pendse, Highland Park, all of N.J., assignors to Hatco Chemical Corporation, Fords, N.J.

Filed Aug. 26, 1983, Ser. No. 526,581
Int. Cl.³ C07C *125/065*
U.S. Cl. 560—163 **23 Claims**

1. A method of synthesizing N-benzyloxycarbonyl-L-aspartic acid by condensing benzyl chloroformate and a dialkali metal salt of L-aspartic acid in aqueous solution, comprising adding benzyl chloroformate and an alkali metal hydroxide solution to an alkaline aqueous mixture containing L-aspartic acid while maintaining the temperature of the reaction mixture above 45° C. and at a pH of at least 9.2 and upon completion of the reaction acidifying the reaction mixture.

4,523,027

PURIFICATION OF CARBOXYLATES CONTAINING ALDEHYDES, ACETALS AND/OR UNSATURATED COMPOUNDS

Rudolf Kummer, Frankenthal; Heinz-Walter Schneider, Ludwigshafen; Volker Taglieber, Eppelheim, and Franz-Josef Weiss, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,006
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228500
Int. Cl.³ C07C *67/56*
U.S. Cl. 560—191 **5 Claims**

1. A process for purifying a carboxylate which contains aldehydes, acetals and/or unsaturated compounds and is obtained by reacting an olefinically unsaturated compound with carbon monoxide and an alkanol which process comprises: treating said carboxylate with hydrogen at elevated temperatures in the presence of an acidic ion exchanger or zeolite doped with one or more metals of group VIII of the periodic table, and separating the resulting low and/or high boilers by distillation.

5. The process of claim 1, wherein the starting mixture is dimethyl adipate containing, as impurities, methyl 5-formylvalerate and/or methyl 6,6-dimethoxycaproate and/or dimethyl butenedicarboxylate and/or tridecenones.

4,523,028

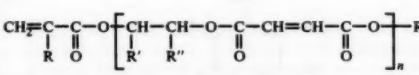
ACRYLIC OR METHACRYLIC TERMINATED OLIGOMERS

Everett J. Kelley, Moorestown, N.J., assignor to Rohm and Haas Company, Phiadelphia, Pa.

Division of Ser. No. 373,372, Apr. 30, 1982, Pat. No. 4,463,150. This application Feb. 13, 1984, Ser. No. 579,613
Int. Cl.³ C07C *69/34, 69/52*
U.S. Cl. 560—199 **3 Claims**

1. An oligomer comprising the formula:

(I)



wherein n is greater than or equal to 2;

R=—H, —CH_3, or —C_2H_5;

R′, R″=—H, —CH_3, —C_2H_5, —CH_2Cl, —CH_2Br, —C_6H_5,

$-CH_2OCOCH=CH_2$, $-CH_2OCOC(CH_3)=CH_2$, $-CH_2OCH_2CH=CH_2$, $-CH_2OC_6H_5$, or $-CH_2OC_4H_9$, or R' plus R'' form a cyclic ring $-C_4H_8-$; and

R''' = —H or $-C_2H_4OH$.

4,523,029

OXIDATIVE CARBONYLATION OF ALCOHOLS TO PRODUCE DIALKYL OXALATES

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 15, 1982, Ser. No. 389,209

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—204 **8 Claims**

1. A process for the preparation of dialkyl oxalates by the oxidative carbonylation reaction which comprises reacting an alkanol having from 1 to 6 carbon atoms with a mixture of carbon monoxide and oxygen in the presence of a heterogeneous catalyst comprising palladium and thallium on carbon at a temperature between about 30° C. and 100° C. and a carbon monoxide partial pressure in the range of about 500 psi to 1500 psi.

4,523,030

BENZOPHENONES

Georges Haas, Binningen; Andreas von Sprecher, Oberwil, and Pier G. Ferrini, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

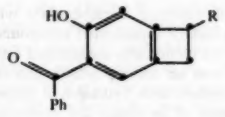
Filed Jun. 7, 1984, Ser. No. 618,152

Claims priority, application Switzerland, Jun. 15, 1983, 3270/83

Int. Cl.³ C07C *65/32*

U.S. Cl. 562—460 **20 Claims**

1. A novel substituted benzophenone of the formula



(I)

in which Ph represents unsubstituted or substituted phenyl and R represents free, esterified or amidated carboxy, or a salt thereof.

4,523,031

PROCESS FOR PRODUCING A PARA-SUBSTITUTED PHENOL DERIVATIVE

Hidefumi Hirai, and Makoto Komiyama, both of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

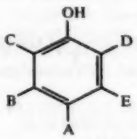
Continuation-in-part of Ser. No. 385,405, May 17, 1982, abandoned. This application Sep. 7, 1983, Ser. No. 530,158

Claims priority, application Japan, Aug. 11, 1981, 56-125558; Aug. 13, 1981, 56-127077

Int. Cl.³ C07C *65/04*

U.S. Cl. 562—475 **10 Claims**

1. A process for producing a para-substituted phenol derivative which comprises reacting a phenol compound represented by the formula (I)



(I)

wherein A, B, C, D and E each independently stand for hydrogen, a hydroxyl group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted allyl group, a substituted or unsubstituted alkoxyl group or a substituted or unsubstituted aryl group, provided that A does not stand for a hydroxyl group and that when two or more of A, B, C, D, and E each independently stand for a substituted or unsubstituted alkyl group or a substituted or unsubstituted alkoxyl group, they have their respective free terminal ends or at least one of them is bonded to another group selected from said alkyl and alkoxyl groups to form a ring,

with an organic halide selected from the group consisting of a carbon tetrahalide and a substituted or unsubstituted allyl halide in the presence of an alkali metal hydroxide, using as a catalyst a modified or unmodified cyclodextrin, thereby to introduce a substituent group derived from said organic halide to the para-position of the phenol compound.

4,523,032

3,5-DIALKYL-4-HYDROXYPHENYL-SUBSTITUTED ACETIC ACIDS

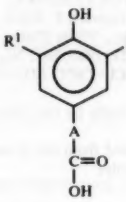
John T. Lai, Broadview Hgts., Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 7, 1983, Ser. No. 549,034

Int. Cl.³ C07C *65/01*

U.S. Cl. 562—478 **16 Claims**

1. 3,5-dialkyl-4-hydroxyphenyl-substituted acetic acids having the formula



wherein R^1 and R^2 are alkyl or cycloalkyl groups containing 1 to 12 carbon atoms, alkylcycloalkyls and aryl or alkaryl groups wherein the alkyl groups contain 1 to 8 carbon atoms, and A is (1) an alkyl group having the formula

wherein R^3 and R^4 are alkyl groups containing 1 to 18 carbon atoms, or (2) a cycloalkyl group containing 5 to 12 carbon atoms, and alkaryl groups wherein the alkyl groups contain 1 to 8 carbon atoms.

4,523,033

HEART TESTING COMPOUND

Furn F. Knapp, Jr., Oak Ridge, and Mark M. Goodman, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 509,077

Int. Cl.³ C07C *57/30*

U.S. Cl. 562—496 **1 Claim**

1. The compound 15-(p-[^{125}I]-iodophenyl-6-tellurapentadecanoic acid.

4,523,034

HERBICIDAL DIPHENYL ETHERS, THEIR PREPARATION AND THEIR USE AS HERBICIDES

Adolf Parg, Bad Durkheim; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

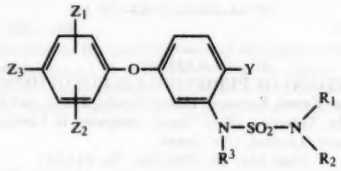
Filed Mar. 10, 1982, Ser. No. 356,736

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114072

Int. Cl.³ C07C *143/86;* A01N *41/00*

U.S. Cl. 564—79 5 Claims

1. A diphenyl ether of the formula



where Z_1 and Z_2 independently of one another are each hydrogen, halogen, nitro, cyano, carboxyl, lower alkyl, lower haloalkyl or lower alkoxy, Z_3 is halogen, nitro, cyano, lower alkyl, lower haloalkyl, lower alkoxy, lower haloalkyl, lower alkylmercapto, lower haloalkylmercapto, lower alkylsulfinyl, lower haloalkylsulfinyl, lower alkylsulfonyl or lower haloalkylsulfonyl, Y is cyano or nitro, R_1 is hydrogen, lower alkyl, cycloalkyl, lower alkoxy, lower haloalkyl or lower alkoxyalkyl, R_2 is hydrogen, lower alkyl, acyl or an alkali metal atom and R_3 is hydrogen, lower alkyl or an alkali metal atom.

4,523,035

PROCESS FOR SYNTHESIZING SQUARAINE COMPOSITIONS

John F. Yanus, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1983, Ser. No. 557,801

Int. Cl.³ C07C *85/00, 85/02, 85/06*

U.S. Cl. 564—307 10 Claims

1. A process for synthesizing a squaraine composition comprising forming a mixture comprising squaric acid, a primary alcohol having a boiling point at atmospheric pressure between about 130° C. and about 210° C. and a tertiary amine and heating said mixture in vacuo below the boiling points of said primary alcohol and said tertiary amine to form said squaraine composition.

4,523,036

PROCESS FOR THE PREPARATION OF ALDEHYDES

Boy Cornils, Dinslaken; Josef Hibbel, Oberhausen; Bernhard Lieder, Bottrop; Joachim Much, Oberhausen; Volkmar Schmidt, Oberhausen; Ernst Wiebus, Oberhausen, and Werner Konkol, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,645

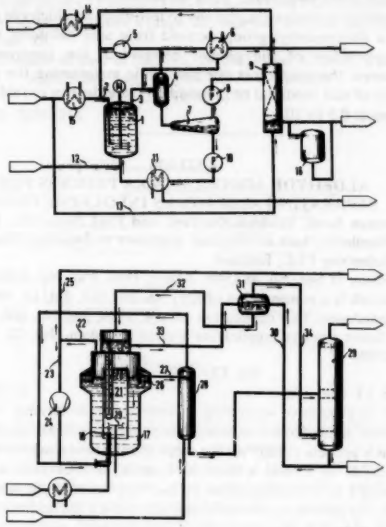
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234701

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 42 Claims

1. In a process for the preparation of an aldehyde comprising contacting a starting material comprising an olefin, carbon monoxide, hydrogen and water in the presence of a water-soluble rhodium-phosphine complex as a catalyst, wherein a portion of said starting material, under the reaction conditions, forms a first gaseous component and a second portion of said starting material, under the reaction conditions, forms a first liquid component by homogeneously mixing said first component at a temperature of about 90° to about 150° C. and a pressure of about 100 to about 30,000 kPa whereby a product is formed, said product comprising second gaseous and second liquid components, and cooling said product,

the improvement comprising the proportion of said first gaseous component in said first liquid component being about 5% to about 30% by volume, based on the total of



said first gaseous and first liquid components, and separating said second liquid and said gaseous components from each other to form a liquid phase and a gaseous phase, said separating occurring prior to said cooling.

4,523,037

PROCESS FOR SELECTIVELY PRODUCING PARA-SUBSTITUTED DERIVATIVES OF PHENOLS

Hidefumi Hirai, and Makoto Komiyama, both of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

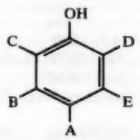
Continuation-in-part of Ser. No. 385,405, filed as PCT JP 82/00066, Mar. 9, 1982, published as WO 82/03073, Sep. 16, 1982, § 102(e), dated May 17, 1982, abandoned. This application Sep. 7, 1983, Ser. No. 530,157

Claims priority, application Japan, Mar. 9, 1981, 56-32542; Sep. 25, 1981, 56-151571; Sep. 26, 1981, 56-152524

Int. Cl.³ C07C *5/393*

U.S. Cl. 568—442 10 Claims

1. In a process for producing a para-substituted phenol derivative which comprises reacting a phenol compound represented by the formula (I)



(I)

wherein A, B, C, D and E each independently stand for hydrogen, a hydroxyl group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted allyl group, a substituted or unsubstituted alkoxyl group or a substituted or unsubstituted aryl group, provided that A does not stand for a hydroxyl group and that when two or more of A, B, C, D, and E each independently stand for a substituted or unsubstituted alkyl

group or a substituted or unsubstituted alkoxyl group, they have their respective free terminal ends or at least one of them is bonded to another group selected from said alkyl and alkoxyl groups to form a ring, with a haloform in the presence of an alakli metal hydroxide, using as a catalyst a modified or unmodified cyclodextrin, thereby to introduce an aldehyde group or a dihalomethyl group derived from said haloform to the para-position of the phenol compound, the improvement wherein the reaction is effected while maintaining the molar ratio of said modified or unmodified cyclodextrin to said haloform at 0.5 to 10.

4,523,038

ALDEHYDE ADDUCTS AND A PROCESS FOR SEPARATING ALDEHYDES INVOLVING THEM

Norman Scott, Stockton-On-Tees, and Paul Hepworth, Upper Poppleton, both of England, assignors to Imperial Chemical Industries PLC, England

Division of Ser. No. 482,986, Apr. 7, 1983, Pat. No. 4,480,139, which is a continuation of Ser. No. 282,953, Jul. 13, 1981, abandoned. This application May 4, 1984, Ser. No. 606,943

Claims priority, application United Kingdom, Jul. 22, 1980, 8023888

Int. Cl.³ C07C *45/78*

U.S. Cl. 568—492 **13 Claims**

1. A process of separating a linear aldehyde having 7 to 21 carbon atoms from a mixture comprising the linear aldehyde, which process comprises the steps of (a) converting the linear aldehyde to a solid adduct with an α, ω linear alkane diol having 2 to 12 carbon atoms by reacting the adehyde with the diol, (b) separating the solid adduct and (c) decomposing the solid adduct to regenerate the linear aldehyde and the diol.

4,523,039

METHOD FOR FORMING PERFLUOROCARBON ETHERS

Richard J. Lagow, Austin, Tex., and Glenn E. Gerhardt, Wilmington, Del., assignors to The University of Texas, Austin, Tex.

Continuation of Ser. No. 139,181, Apr. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 901,905, May 1, 1978, abandoned. This application Dec. 19, 1983, Ser. No. 563,013

Int. Cl.³ C07C *41/01*

U.S. Cl. 568—615 **6 Claims**

1. A method for forming fluorocarbon ethers having perfluoralkyl groups, comprising:

a. fluorinating a high molecular weight polyether under conditions which produce a fluorinated polyether;

b. subjecting said fluorinated polyether to a temperature which is higher than the temperature used in the conditions in step a, and between approximately 55° C. and 210° C. to cause a controlled fragmentation of said polyether into lower molecular weight fluorocarbon ether compounds; and

c. separating said fluorocarbon ether compounds from the reaction mixture.

4,523,040

METHYL HALIDES AND METHYL ALCOHOL FROM METHANE

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Continuation of Ser. No. 298,390, Sep. 1, 1981, abandoned. This application May 16, 1983, Ser. No. 494,915

Int. Cl.³ C07C *41/01, 27/00, 29/00*

U.S. Cl. 568—671 **11 Claims**

1. A process for the catalytic production of methyl monohalides from methane, such process exhibiting 85 to 99% selectivity, consisting essentially of reacting methane with a halogen selected from chlorine, bromine or iodine at a temperature between about 100° and 325° C. in the presence of a solid acid catalyst from the Group IVB, VB or VIB transition metal oxides or oxyhalides supported on a chalconite carrier.

6. A process for producing methyl alcohol and by the reaction of methane, halogen selected from chlorine, bromine or iodine, and water at a temperature between about 100° and 325° C. in the presence of a catalyst from the group IVB, VB or VIB transition metal oxides or oxyhalides supported on a chalconite carrier.

8. A process of claim 1 including the further step of hydrolyzing the methyl monohalide obtained to methyl alcohol and/or dimethyl ether.

4,523,041

METHOD OF PURIFYING 4-FLUOROPHENOL

Toshikazu Kawai, Kawagoe; Haruo Suzuki, Tokyo, and Shouzou Kaneda, Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 25, 1984, Ser. No. 614,047

Claims priority, application Japan, Jun. 23, 1983, 58-111819

Int. Cl.³ C07C *37/86, 37/68*

U.S. Cl. 568—755 **7 Claims**

1. A method of purifying crude 4-fluorophenol containing phenol as impurity, the method comprising the steps of:

adding a phthal-compound which readily reacts with phenol but hardly reacts with 4-fluorophenol and a dehydrating agent to the crude 4-fluorophenol to obtain a mixture;

keeping said mixture in a liquid state until substantial completion of the reaction between said phenol and said phthal-compound; and

recovering 4-fluorophenol from the mixture containing the products of said reaction.

4,523,042

DERIVATIVES OF ALPHA-ALKYL POLYOLEFINIC CARBOXYLIC ACID USEFUL IN THE TREATMENT OF PSORIASIS

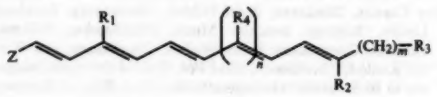
Bernard Loev, Scarsdale; Howard Jones, Ossining, and Wan-kit Chan, Yorktown Heights, all of N.Y., assignors to USV Pharmaceutical, Tuckahoe, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,785

Int. Cl.³ C07C *35/18*

U.S. Cl. 568—824 **11 Claims**

1. Compounds of the structure



wherein

n is 0 to 3,

m is 0 to 1, and

R_1 and R_4 are each independently hydrogen or an alkyl group of from 1 to 5 carbon atoms;

R_2 is an alkyl group of from 1 to 5 carbon atoms;

R_3 is hydroxy;

R_5 is independently H, C_1–C_{20} alkyl, aryl, aralkyl, and

Z is a cycloalkyl, cycloalkenyl or cyclodialkenyl group substituted with from 0 to 5 C_1–C_5 alkyl groups, a keto group or a hydroxyl group, or a phenyl group substituted with from 0 to 4 hydroxy, C_1–C_5 alkoxy, C_1–C_5 alkyl or trifluoromethyl groups or halogen atoms or combinations thereof; and the pharmaceutically-acceptable salts thereof.

4,523,043
REAGENT AND METHOD FOR DECOMPOSING ORGANOSULFUR COMPOUNDS

Louis L. Pytlewski; Kenneth Krevitz, both of Philadelphia, Pa., and Arthur B. Smith, Newark, Del., assignors to The Franklin Institute, Philadelphia, Pa.

Continuation-in-part of Ser. No. 386,945, Jun. 10, 1982, abandoned, which is a division of Ser. No. 158,359, Jun. 11, 1980, Pat. No. 4,337,368, which is a continuation-in-part of Ser. No. 142,865, Apr. 21, 1980, abandoned. This application Jan. 18, 1984, Ser. No. 571,845

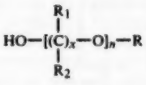
The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.[3] **C07C** *29/00, 31/08*

U.S. Cl. 568—840 **9 Claims**

1. A process for the decomposition of an organosulfur compound containing a C-S bond, comprising the steps of:

(a) providing a decomposition reagent formed by reacting an alkali metal, a reactant having the general formula:



wherein R is hydrogen or lower alkyl, R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, unsubstituted or substituted lower alkyl, unsubstituted or substituted cycloalkyl having from 5 to 8 carbon atoms, and unsubstituted or substituted aryl, n has a value from about 2 to about 400 and x has a value of at least 2, and oxygen; and

(b) reacting said decomposition reagent with said organosulfur compound in the presence of oxygen to effect cleavage of said C-S bond, thereby decomposing said organosulfur compound.

4,523,044
COMPOSITIONS OF POLYARYLALKANE OLIGOMERS AND PROCESS FOR THEIR MANUFACTURE

Raymond Commandeur, Vizille, and Bernard Gurtner, Grenoble, both of France, assignors to Atochem, Courbevoie, France

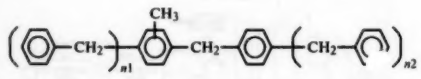
Filed Sep. 13, 1984, Ser. No. 650,765

Claims priority, application France, Sep. 23, 1983, 83 15127

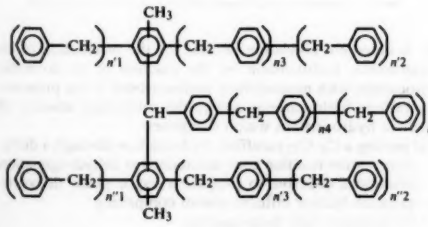
Int. Cl.[3] **C07C** *1/16, 2/02*

U.S. Cl. 585—11 **8 Claims**

1. Polyarylalkane oligomer compositions comprising a mixture of two oligomers A and B, wherein oligomer A is a mixture of isomers of formula:



with n1 and n2=0, 1 and 2, given that n1+n2≦3; and oligomer B is a mixture of isomers of formula:



with n'1, n''1 and n4=0, 1 and 2, n'2, n''2, n3, n'3 and n5=0 and 1, given that n'1+n''1+n'2+n''2+n3+n'3+n4+n5≦2.

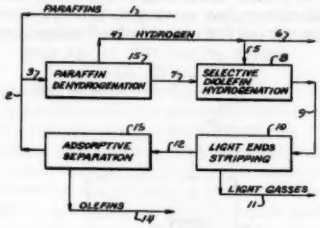
4,523,045
PROCESS FOR CONVERTING PARAFFINS TO OLEFINS

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 596,867, Apr. 4, 1984,. This application Aug. 2, 1984, Ser. No. 637,234

Int. Cl.[3] **C07C** *5/00*

U.S. Cl. 585—254 **9 Claims**



1. A process for the production of substantially diolefin-free monoolefinic hydrocarbons which comprises:

(a) passing a feed stream comprising at least one C_4 to C_{20} feed paraffinic hydrocarbon and a hereinafter derived recycle stream characterized as having a monoolefin hydrocarbon concentration of between 0.4 and 1.9 mole percent into a catalytic paraffin dehydrogenation zone maintained at dehydrogenation conditions containing a dehydrogenation catalyst to produce a dehydrogenation zone effluent stream comprising light hydrocarbons, hydrogen, feed paraffinic hydrocarbons and corresponding monoolefinic and diolefinic hydrocarbons;

(b) passing at least a portion of said dehydrogenation zone effluent stream through a selective catalytic hydrogenation zone containing a selective hydrogenation catalyst in the presence of hydrogen having a ratio of 1:1 to 1.8:1 of hydrogen to said diolefinic hydrocarbons and at conditions selected to convert nearly all said diolefinic hydrocarbons to monoolefinic hydrocarbons and to produce a hydrogenation zone effluent stream substantially free of diolefins and containing relatively the same content of paraffinic hydrocarbons as contained in said dehydrogenation zone effluent stream;

(c) passing said hydrogenation effluent stream to a stripping zone to strip hydrogen and light hydrocarbons from said hydrogenation zone effluent stream;

(d) passing said stripped hydrogenation stream to a separation zone effective to concentrate said monoolefinic hydrocarbons into a substantially diolefin-free monoolefinic hydrocarbon-rich product stream and effective to produce a paraffinic hydrocarbon-rich separation zone effluent stream having a monoolefinic hydrocarbon concentration of between 0.4 and 1.9 mole percent; and

(e) passing at least a portion of said paraffinic hydrocarbon-rich separation zone effluent stream into said dehydrogenation zone of step (a) as said characterized recycle stream.

4,523,046
METHOD FOR GASOLINE YIELD ENHANCEMENT IN THE FIXED BED METHANOL-TO-GASOLINE PROCESS

Ronald M. Gould, Sewell, N.J., and Sergei Yurchak, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

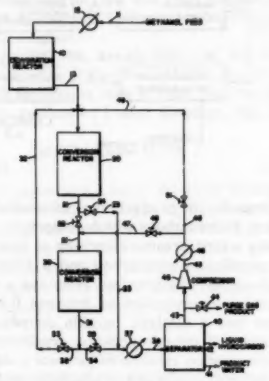
Filed Feb. 25, 1982, Ser. No. 352,417

Int. Cl.[3] **C07C** *1/04*

U.S. Cl. 585—322 **10 Claims**

1. In a process for the conversion of methanol to gasoline

boiling range components which comprises passing a methanol feed through a heat exchanger means and a dehydration reactor means for conversion of said methanol feed to a dehydration product comprising methanol, dimethyl ether and water, and passing said dehydration product through a single fixed catalyst bed so as to completely convert said dehydration product to a product rich in gasoline boiling components, the improvement which comprises; dividing said fixed catalyst bed into a plurality of separate fixed catalyst beds comprising a first reactor bed and at least one downstream reactor bed, passing said dehydration product through said first reactor bed to complete conversion of said dehydration product therein and produce an effluent comprising said gasoline-rich product, continuing to complete conversion of dehydration product passing through said first reactor bed and bypassing said down-



stream reactor beds until such time as there is a predetermined decline of said complete conversion of said dehydration product whereupon said dehydration product is passed through said first reactor bed and said effluent comprising partially converted dehydration product passes from said first reactor bed to said downstream reactor bed to yield said complete conversion, continuing complete conversion and placing subsequent downstream reactor beds in service only upon such time as said predetermined decline of complete conversion in an immediately preceeding downstream reactor bed is detected until the final reactor bed of said plurality of separate catalyst beds is placed in service, whereby gasoline yields and cycle lengths from conversion in said divided fixed catalyst bed is improved over said single fixed catalyst bed at equivalent conversion conditions.

4,523,047

PROCESS FOR SYNGAS CONVERSIONS TO LIQUID HYDROCARBON PRODUCTS UTILIZING ZSM-45 ZEOLITE

Arthur W. Chester, Cherry Hill; Tai-Sheng Chou, Sewell, and Yung-Feng Chu, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 536,067, Sep. 26, 1983, Pat. No. 4,471,145, which is a continuation-in-part of Ser. No. 445,810, Dec. 1, 1982, Pat. No. 4,423,265. This application Jul. 16, 1984, Ser. No. 631,684

Int. Cl.³ C07C *1/04, 1/06*

U.S. Cl. 585—322 **8 Claims**

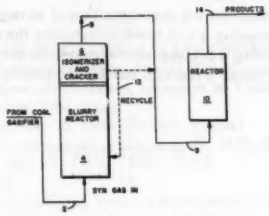
1. A process for converting synthesis gas to liquid hydrocarbons having a boiling range within that of gasoline and distillate comprising the steps of:

(a) charging said synthesis gets to a Fischer-Tropsch synthesis conversion zone comprising a catalyst providing CO reducing characteristics in a single form or a combination of catalyst particles in direct contact with a suspending liquid medium;

(b) separating at least a fraction of said suspending liquid medium containing dissolved heavier hydrocarbons from said catalyst particles;

(c) contacting said separated suspending medium containing heavier hydrocarbons in a cracking zone with a cracking and isomerization catalyst comprising zeolite ZSM-45 under conditions effective to crack and isomerize at least a portion of said heavier hydrocarbons to lighter hydrocarbons;

(d) separating the resultant product stream of (c) into two streams;



(e) removing an effluent stream from said conversion zone of (a) to a second reaction zone containing a crystalline zeolite catalyst;

(f) returning one of said streams of (d) to said effluent stream from zone (a);

(g) returning the remaining stream of (d) to said conversion zone of (a); and

(h) contacting said effluent stream from said conversion zone of (a) with a crystalline zeolite to convert the product of said Fischer-Tropsch synthesis gas conversion to hydrocarbons boiling within the range of distillate and gasoline.

4,523,048

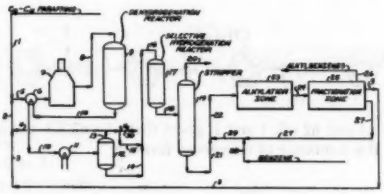
PROCESS FOR THE SELECTIVE PRODUCTION OF ALKYLBENZENES

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 4, 1984, Ser. No. 596,772

Int. Cl.³ C07C *1/00*

U.S. Cl. 585—323 **14 Claims**



1. A detergent alkylation process for the production of an alkylaromatic hydrocarbon by the reaction of an aromatic hydrocarbon with monoolefinic hydrocarbons in the presence of paraffinic hydrocarbons and in the substantial absence of diolefinic hydrocarbons which comprises:

(a) passing a C_6–C_{22} paraffinic hydrocarbon through a dehydrogenation reaction zone maintained at dehydrogenation conditions effective to produce a vapor phase dehydrogenation reactor effluent stream comprising

(i) C_6-minus light hydrocarbons

(ii) C_6–C_{22} paraffinic hydrocarbons

(iii) C_6–C_{22} monoolefinic hydrocarbons
(iv) C_6–C_{22} diolefinic hydrocarbons and
(v) hydrogen;
(b) cooling and partially condensing said dehydrogenation reactor zone effluent to form a vapor-liquid dehydrogenation reactor zone effluent;
(c) passing said vapor-liquid dehydrogenation reactor zone effluent to a vapor-liquid separation zone to separate said vapor-liquid dehydrogenation reactor effluent stream into a vapor phase process stream comprising hydrogen and a liquid phase process stream which comprises:
(i) dissolved hydrogen
(ii) C_6-minus light hydrocarbons
(iii) C_6–C_{22} paraffinic hydrocarbons
(iv) C_6–C_{22} diolefin hydrocarbons;
(d) passing said liquid phase process stream derived from said vapor-liquid separtion zone and a controlled amount of a hydrogen feed stream through a selective hydrogenation reaction zone located downstream of said vapor-liquid separation zone and upstream of a hereinafter defined stripping zone of step (e), said selective hydrogenation zone containing a selective hydrogenation catalyst and maintained at selective hydrogenation conditions, wherein said amount of hydrogen in said hydrogen feed stream is selected to convert substantially all of said C_6–C_{22} diolefin to the corresponding monoolefinic hydrocarbon and to produce a hydrogenation reaction zone effluent stream substantially free of C_6–C_{22} diolefinic hydrocarbons and comprising
(i) hydrogen
(ii) dissolved C_6-minus light hydrocarbons
(iii) C_6–C_{22} paraffinic hydrocarbons; and
(iv) C_6–C_{22} monoolefinic hydrocarbons;
(e) passing said hydrogenation reaction zone effluent stream into a stripping zone operated at conditions to selectively separate and remove hydrogen and C_6-minus light hydrocarbons from said hydrogenation effluent stream and to produce a stripping zone bottom effluent stream comprising:
(i) C_6–C_{22} paraffinic hydrocarbons and
(ii) C_6–C_{22} monoolefinic hydrocarbons;
(f) passing said stripping zone bottoms effluent stream and an aromatic hydrocarbon into an alkylation zone maintained at alkylation-promoting conditions and containing an alkylation zone catalyst to alkylate said aromatic hydrocarbon and to produce an alkylation zone effluent stream comprising:
(i) alkylaromatic hydrocarbon; and
(ii) C_6–C_{22} paraffinic hydrocarbon; and
(g) recovering said alkylaromatic hydrocarbon from said alkylation zone as the product of said detergent alkylate process.

4,523,049

METHANE CONVERSION PROCESS

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield; John A. Sofranko, Malvern, and Howard P. Withers, Pottstown, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,656
Int. Cl.³ C07C *2/00*
U.S. Cl. 585—500 **45 Claims**

1. In an improved method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane with a contact solid comprising at least one reducible oxide of at least one metal which oxide when contacted with methane at a temperature within the range of about 500° to 1000° C. is reduced and produces higher hydrocarbon products and water, the improvement which comprises conducting the contacting in the presence of an oxygen-containing gas, said solid further comprising at least one member selected from the group consisting of alkali metals, alkaline earth metals, and compounds thereof.

4,523,050

METHANE CONVERSION PROCESS

C. Andrew Jones, Newtown Square, and John A. Sofranko, Malvern, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,670
Int. Cl.³ C07C *2/00*
U.S. Cl. 585—500 **15 Claims**

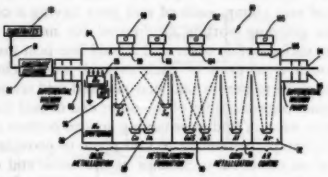
1. A method for converting methane to higher hydrocarbon products which comprises contacting a hydrocarbon gas comprising methane and an oxygen-containing gas with a contact solid comprising at least one manganese silicate at conditions to convert methane to said products.

4,523,051

THIN FILMS OF MIXED METAL COMPOUNDS

Reid A. Mickelsen, Bellevue, and Wen S. Chen, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1983, Ser. No. 536,395
Int. Cl.[3] H01L *31/06, 31/18*
U.S. Cl. 136—260 18 Claims



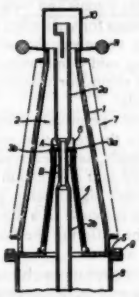
14. A thin film heterojunction solar cell, said heterojunction comprising a p-type I-III-IV_2 chalcopyrite substrate and an overlying layer of an n-type ternary mixed metal compound wherein said ternary mixed metal compound is applied to said substrate by introducing the vapor of a first metal compound to a vessel containing said substrate from a first vapor source while simultaneously introducing a vapor of a second metal compound from a second vapor source of said vessel, said first and second metals comprising the metal components of said mixed metal compound; independently controlling the vaporization rate of said first and second vapor sources; reducing the mean free path between vapor particles in said vessel, said gas being present in an amount sufficient to induce homogeneity of said vapor mixture; and depositing said mixed metal compound on said substrate in the form of a uniform composition polycrystalline mixed metal compound.

4,523,052

GAS-INSULATED BUSHING

Shuzou Takahashi, and Hiroaki Toda, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 19, 1983, Ser. No. 495,936
Claims priority, application Japan, May 19, 1982, 57-73280
Int. Cl.[3] H01B *17/36, 17/54, 17/28*
U.S. Cl. 174—16 BH 8 Claims



1. A gas-insulated bushing comprising:
an insulating tube filled with an insulating gas;
a central conductor centrally arranged within the insulating tube;
a capacitor unit connected to the central conductor and partitioning the interior of the insulating tube;
said central conductor having an intermediate constriction to which the capacitor unit is connected, said central conductor comprising two connected conductor parts, at least one of which is terminally restricted to form said constriction;
a pair of flanges secured to the ends of respective of said conductor parts and connecting said conductor parts at said constriction; and
a shield member supported on one of said flanges spaced apart from said conductor parts at the constriction in order to relieve the electric field at the constriction.

4,523,053

VIBRATION DAMPER

Charles B. Rawlins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1983, Ser. No. 565,179
Int. Cl.[3] H02G *7/14*
U.S. Cl. 174—42 3 Claims

1. A compact vibration damping device comprising:
an arm of a clamping means, and
an inertial weight member suspended from said arm, the damping device including further:
a system for suspending the weight member from the arm, the system comprising at least two diametrically opposed elastomer pads having predetermined spring constants respectively for relative translational motion of the weight member and arm and for relative rotational motion of the weight member and arm,
the elastomer pads being sandwiched between the weight member and arm and disposed in a plane that contains relative vertical and horizontal degrees of freedom for the weight member and arm such that the pads undergo shearing motion with relative movement of the weight member and arm,
the distance between the pads being substantially equal to twice the square root of the ratio of the rotational to the translational spring constants of the elastomer pads.

4,523,054

LINE-PAST INSULATOR SUPPORT SYSTEM, METHOD OF ASSEMBLY THEREOF, AND CLAMP FOR USE THEREIN

Anthony C. Baker, Rochester, and Thomas A. Pinkham, LeRoy, both of N.Y., assignors to Interpace Corporation, Purchase, N.Y.

Filed Apr. 4, 1983, Ser. No. 482,039
Int. Cl.[3] H02G *7/20;* H01B *17/16, 17/38*
U.S. Cl. 174—45 R 10 Claims

1. An electric power transmission system comprising:
a tower and an electrical conductor;
a line-post insulator extending horizontally from said tower

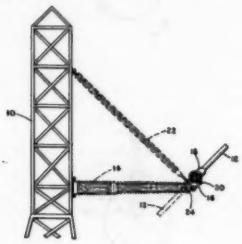
and supporting said conductor at an outer terminus of said line-post insulator away from said tower;

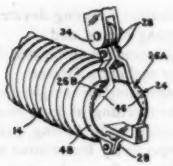
an insulating tension member extending outwardly and downwardly from said tower to meet the outer terminus of said line-post insulator;

means for securing said conductor adjacent said outer terminus of said line-post insulator, said terminus of said line-post insulator having a generally convex surface;

a clamp secured to said tension member, said clamp comprising:

a first jaw and a second jaw passing between said conductor and said line-post insulator for engagement with said convex surface, said second jaw being the mirror image of said first jaw as reflected about a plane including axes of said line-post insulator and said tension member, each of said jaws having a concave arcuate gripping portion configured for mating with said convex surface of said terminus, said gripping portions of said first and said second jaws contacting said convex surface on opposite sides of said plane, each of said jaws having an arm portion curved about a line perpendicular to said plane for clearing said conductor, said arm portions extending from said gripping portions of respective ones of said





jaws to a point of engagement of said clamp with said tension member; and

urging means for urging said jaws together for secure engagement of said gripping portions of said jaws with said outer terminus of said line-post insulator.

7. In an electric power transmission system comprising:

a tower and an electrical conductor;

a line-post insulator extending horizontally from said tower and supporting said conductor at an outer terminus of said line-post insulator away from said tower;

a method of securing said outer terminus of said line-post insulator to said tower during a state of power flow through said conductor comprising:

extending an electrically-insulating tension member from said tower to said terminus;

securing a clamp to an outer end of said tension member, said clamp comprising a pair of opposed jaws, each of said jaws including an arm portion extending toward said tension member;

positioning said clamp between said conductor and said terminus, said positioning including a spacing of said jaws on opposite sides of said insulator at said terminus; and

urging said jaws together while orienting a bend in each of said arm portions of said jaws for providing clearance of said conductor and connection of said tension member with said terminus.

8. A clamp for securing the outer end of a horizontal line-post insulator of an electric power transmission system comprising:

a first jaw and a second jaw, said second jaw being the mirror image of said first jaw as reflected about a central plane of said clamp, each of said jaws having a concave arcuate gripping portion configured for mating with a convex surface of an outer end of said line-post insulator, the concave portions of each of said jaws facing said central plane to permit said first jaw and said second jaw to contact opposite sides of the outer end of said line-post insulator, each of said jaws having an arm portion curved about a line perpendicular to said plane to provide clearance of an electrical conductor at the outer end of said line-post insulator, said arm portions extending from said gripping portions of respective ones of said jaws to permit engagement with a tension member of a power transmission system; and

urging means for urging the arm portions of said first and said second jaws toward each other to permit secure engagement of said gripping portions of said jaws with said outer end of said line-post insulator.

4,523,055

VOICE/TEXT STORAGE AND RETRIEVAL SYSTEM

G. Burnell Hohl, Norwalk, Conn., and Donatas V. Gasiunas, Carmel, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 25, 1983, Ser. No. 555,262
Int. Cl.³ H04M *1/64, 3/42, 11/10*
U.S. Cl. 179—2 DP **46 Claims**

1. A voice/text storage and retrieval apparatus comprising:

(a) digital mass storage means for storage and retrieval of digital data and of digitized voice signal data;

(b) first processor means for controlling access to said digital mass storage means;

(c) host processor means for monitoring, coordination and supervision of the operation of said apparatus;

(d) communications processor means for reception and retransmission of digital data;

(e) interface means for receiving and transmitting both digital data signals and analog voice signals, said interface means further comprising detection means for the detection of digital data signals and switch means responsive to said detection means for separating said digital data signals from said analog voice signals, said switch means operatively connecting said communications processor means to said interface means for transmission and reception of said digital signals;

(f) conversion means operatively connected to said interface switch means for the reception and transmission of said analog voice signals, said received analog voice signals being digitized by said conversion means and said transmitted analog voice signal being generated by said conversion means in response to a digital input;

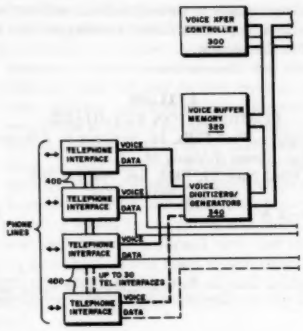
(g) buffer means for buffering the flow of data to and from said conversion means;

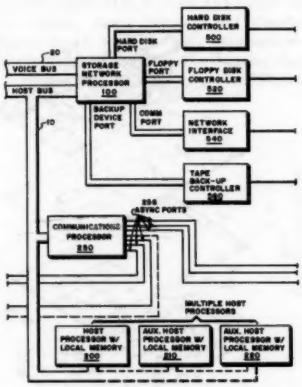
(h) voice transfer control means for controlling the transfer of data between said buffer means and said conversion means for signaling said host processor when a block of said digitized voice signal data must be transferred between said bufer and said mass storage means and in response to signals from said first processor means controlling such block transfers;

(i) a first bus operatively interconnecting said first processor means, said communications processor means and said host processor means, whereby digital data received by, or to be transmitted by said communications processor may be transferred between said mass storage means and said communications processor means under control of

said first processor means and in response to commands from said host processor means;

(j) a second bus operatively interconnecting said first processor means, said voice transfer control means, said buffer means and said conversion means, whereby said digitized voice data may be transferred between said buffer means and said conversion means and blocks of said digitized





voice data may be transferred between said mass storage means and said buffer means under control of said first processor means and said voice transfer control means; and

(k) said first bus being further operatively connected to said voice transfer control means whereby said host processor means may initiate or halt digitized voice data signal transfers to and from said conversion means.

4,523,056

TELEPHONE INCLUDING RESISTIVE ARRAY FOR DIALING AND SYSTEM FOR USING SUCH TELEPHONE

Thomas M. Fisher, Plano, Tex., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,292
Int. Cl.³ H04M 1/72
U.S. Cl. 179—81 R **29 Claims**

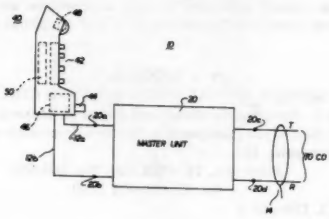
1. A system for providing service between a subscriber and a central office comprising:

(a) at least one telephone set adapted for use in said system, said telephone set having at least information entering means, receiver means for converting electrical signals to acoustical signals, transmitter means for converting acoustical signals to electrical signals and switch means,

(i) said switch means having one position when said telephone set is on-hook and another position when said telephone set is off-hook, each of said switch means positions providing said telephone set with a predetermined electrical characteristic,

(ii) said information entering means providing a multiplicity of unique impedances which are only non-reactive for said telephone set, each associated with the entry by said subscriber when said telephone set is off-hook of a respective one of a multiplicity of discrete pieces of information; and

(b) at least one interface means electrically connected between said central office and said telephone set, said interface means receiving:



(i) electrical information carrying signals and ringing signals from said central office, said information carrying signals being received when said telephone set is off-hook and said ringing signals being received when said telephone set is on-hook, and

(ii) electrical signals from said telephone set when said telephone set is off-hook,

said interface means including means responsive to said ringing signal for generating an alerting signal and means responsive to said unique non-reactive impedances in combination with said off-hook electrical characteristic for generating central office interpretable dialing signals

said interface means transmitting:

(i) to said central office said dialing interpretable signals, and

(ii) to said telephone set information signals and said alerting signal, said telephone set responsive to said alerting signal for alerting said subscriber.

4,523,057

HIGH GAIN CASCODE AMPLIFIER WITH NEGATIVE FEEDBACK

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Business Communication Systems, Northlake, Ill.

Filed Apr. 2, 1984, Ser. No. 596,175
Int. Cl.³ H04N 1/60
U.S. Cl. 179—81 B **9 Claims**

1. A subscriber's telephone instrument circuit connected to a telephone line and including a microphone and an amplifier connected between said microphone and said telephone line, said amplifier comprising:

a cascode amplifier stage including an input and an output;

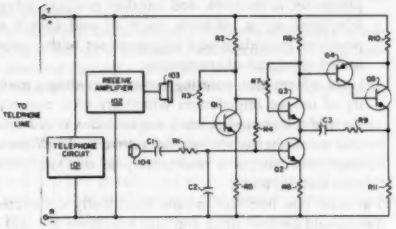
a low frequency cutoff filter connected to said microphone;

a phase shifting filter connected between said cutoff filter and the input of said cascode amplifier stage;

a bias current source connected across said telephone line and including an output connected to said cascode stage; and

a composite amplifier stage including an input connected to

said cascode amplifier output and further including an output connected to said telephone line; whereby electrical signals generated by said microphone are amplified and subsequently conducted to said telephone line.

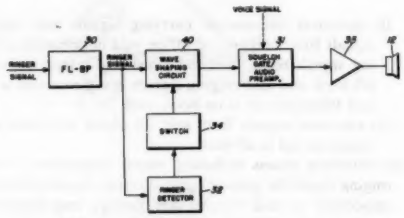


4,523,058

RINGER SIGNAL WAVE SHAPING CIRCUIT

James C. Stevens, Plainfield, and James R. Haynes, Indianapolis, both of Ind., assignors to Uniden Corporation of America, Indianapolis, Ind.

Filed Oct. 24, 1983, Ser. No. 544,643
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—84 T **9 Claims**



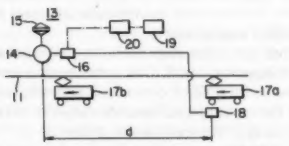
1. In a telephone handset having audio output means to which an audio frequency ringer signal is periodically applied when the handset is in an on-hook condition, an improvement comprising a wave shaping circuit to initially block each ringer signal, and then gradually increase the amplitude of each ringer signal to substantially the level it would have had without said wave shaping circuit during a period of time not greater than the duration of each ringer signal.

4,523,059

POWER STORAGE SYSTEM FOR ELECTRIC RAILWAY

Toshimi Kawamura, Osaka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 17, 1982, Ser. No. 419,519
Claims priority, application Japan, Sep. 25, 1981, 56-152790
Int. Cl.³ B60L *9/00*
U.S. Cl. 191—6 **3 Claims**



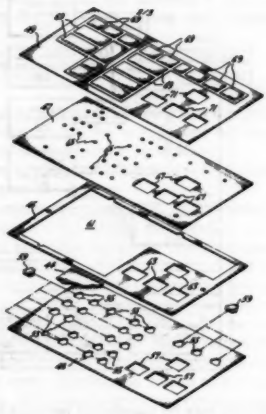
1. A power storage system for electric railways having sections comprising a motor-generator connected to a power system for feeding an electric vehicle running in said sections with electric power, a flywheel coupled to said motor-generator, and means including a controller having information on the position of said vehicle in said sections for controlling said motor-generator based on the position information to increase the speed of said flywheel and store power and immediately thereafter to discharge power stored in said flywheel by driving said motor-generator in correspondence with arrival of the electric vehicle at a predetermined running section and running thereof in the section.

4,523,060

COMBINATION KEYBOARD

Helen E. Maguire, Post Falls, Id., assignor to Advanced Input Devices, Inc., Couer d'Alene, Id.

Filed Nov. 17, 1983, Ser. No. 552,705
Int. Cl.³ H01H *9/26*
U.S. Cl. 200—5 A **8 Claims**



1. A combination keyboard comprising:

(a) a discrete keyboard comprising:

(1) a first set of depression actuated switches lying in a common plane, said first set of depression actuated switches comprising:

(i) a first printed wire board having a plurality of switch contact areas formed on one layer; and,

(ii) a first plurality of depressable switch closing elements, one depressable switch closing element mounted atop each switch contact area, each of said switch contact areas and its overlying depressable switch closing element forming one of said first set of depression actuated switches;

(2) a plurality of discrete keys; and,

(3) mounting means for mounting said plurality of discrete keys such that the keys overlie associated ones of said first set of depression actuated switches and such that the depression of a discrete key actuates its underlying associated switch by depressing the depressable switch closing element of said associated switch;

(b) a membrane keyboard comprising:

(1) a second set of depression actuated switches lying in a

common plane, said second set of depression actuated switches comprising:

(i) a second printed wire board having a plurality of switch contact areas formed on one layer; and,

(ii) a second plurality of depressable switch closing elements, one depressable switch closing element mounted atop each switch contact area, each of said switch contact areas and its overlying depressable switch closing element forming one of said second set of depression actuated switches; and,

(2) a flexible membrane overlying said second set of depression actuated switches such that the depression of selected areas of said flexible overlay depresses and, thus, actuates an underlying associated switch, said membrane keyboard including a plurality of holes sized and positioned so as to allow said plurality of discrete keys of said discrete keyboard to partially extend through said membrane keyboard when said membrane keyboard overlies said discrete keyboard; and,

(c) mounting means for mounting said membrane keyboard above said discrete keyboard such that the said discrete keys pass through said holes in said membrane keyboard such that said selected areas of said flexible overlay and said discrete keys lie in substantially the same actuation plane.

4,523,061

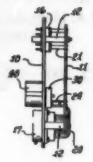
SWITCHING ASSEMBLY FOR TELEPHONE CABLES

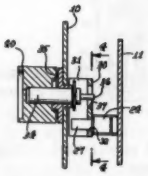
Gideon B. Dagan, Santa Monica, and Charles W. Waas, Huntington Beach, both of Calif., assignors to Communications Technology Corporation, Los Angeles, Calif.

Filed Nov. 10, 1983, Ser. No. 550,311

Int. Cl.³ H01H *3/00*

U.S. Cl. 200—17 R **5 Claims**





1. In a switching assembly for selectively connecting telephone cables to a test set or the like, the combination of:

mounting panel means including a circuit board;

first and second cable connectors carried on said panel means;

a third cable connector carried on said panel means;

a plurality of switches carried on said circuit board, each of said switches having an actuator for actuating each of said switches between first and second positions;

said circuit board providing electrical connections between said third cable connector, said switches, and said first and second cable connectors;

an actuator plate slidingly positioned between said panel means and said switches, said plate having means for engaging said switch actuators; and

means for sliding said actuator plate to actuate said switches between said first and second positions and selectively connect said third cable connector to one of said first and second cable connectors.

4,523,062

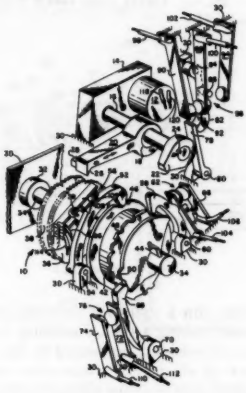
ELECTRICAL APPLIANCE PROGRAMMING

Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 2, 1983, Ser. No. 490,269

Int. Cl.³ H01H *43/00*

U.S. Cl. 200—35 R **7 Claims**



1. An appliance timer comprising:

(a) motor means operable, upon connection to a source of power, to provide rotation of an output shaft;

(b) advance pawl means connected to said output shaft and operative for cyclical advancement and retraction upon rotation of said output shaft;

(c) ratchet means operative to be sequentially advanced by said pawl means advancement, said ratchet means including:

(i) a driven ratchet wheel having an arcuate sector of the outer periphery formed into primary ratchet teeth of a first pitch diameter and the circumferentially adjacent arcuate sector forming the driven ratchet wheel remainder of the formed into secondary ratchet teeth of a major diameter less than the root diameter of the teeth of said first pitch diameter,

(ii) a masking ratchet wheel disposed closely adjacent said driven ratchet, said masking ratchet having ratchet teeth formed about the periphery thereof, said teeth having substantially the same pitch and pitch diameter as said driven ratchet teeth of said first pitch diameter, said masking ratchet having a plurality of radially deep notches formed on the periphery thereof and space circumferentially between a selected multiple of said teeth, said deep notches having the root diameter thereof not greater than the root diameter of said driven ratchet secondary teeth, wherein, said driven ratchet and said masking ratchet are disposed to be advanced by said pawl means and axially spaced an amount not greater than the width of said pawl means; and,

(d) said pawl means is operative upon said advancement to index said driven ratchet wheel and said masking wheel one-for-one when said pawl means contacts said primary ratchet teeth of said first diameter, and said pawl means is operative upon said advancement to index said driven ratchet secondary teeth only when said pawl means drops into one of said deep notches on said masking ratchet; and,

(e) main cam means rotatable upon indexing of said driven ratchet;

(f) switch means, including main cam follower means opera-

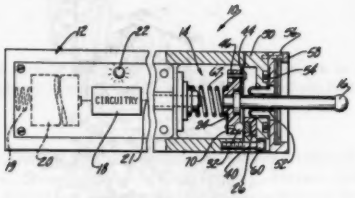
tively contacting said cam means for making and breaking an electrical circuit upon preselected indexing of said driven ratchet wheel.

4,523,063

TOUCH PROBE HAVING NONCONDUCTIVE CONTACT CARRIERS

Charles F. Kroetsch, Warren, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Dec. 5, 1983, Ser. No. 557,754
Int. Cl.³ H01H *3/00*; G01B *5/00*
U.S. Cl. 200—61.41 **15 Claims**



1. In a probe with a stylus for detecting contact with an object, the probe having a switch assembly including a first carrier member transversely connected to the stylus and having a first set of electrically conductive contacts affixed thereto, a second carrier member having a second set of electrically conductive contacts affixed thereto, and whereby electrical characteristics between the two sets of contacts are changed when the stylus contacts an object, wherein the improvement comprises:

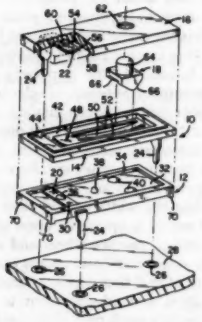
at least one of said carrier members being constructed of a body of electrically nonconductive fiber reinforced plastic thereby simplifying electrical insulation of the contacts affixed thereto while insuring repeatable accurate measurements of the probe.

4,523,064

SNAP ACTION SWITCH

William H. Rose, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 28, 1983, Ser. No. 566,259
Int. Cl.³ H01H *5/18, 9/02*
U.S. Cl. 200—67 D **10 Claims**



1. A snap action switch, comprising:

a dielectric housing including a middle section and first and second outer sections, said middle section having a rectangular opening and said outer sections having a cavity therealong;

a spring blade contact member having one end secured in said middle section, said spring blade contact member including a central compression member arched out of the plane of the spring blade contact member, tension members on each side of the central compression member and a free end defining a movable contact member, said central compression member, said tension members and said movable contact member being disposed in said rectangular opening and freely movable therein;

a first stationary contact member having one end secured in said first outer section and a first stationary contact section disposed along a bottom surface of the cavity thereof in alignment with the movable contact member;

a second stationary contact member having one end secured in said second outer section and a second stationary contact section disposed along a bottom surface of the cavity thereof in alignment with the movable contact member;

means provided by said middle and outer sections matably mounting them together forming said housing with said movable contact member in normal electrical engagement with one of the first and second stationary contact sections; and

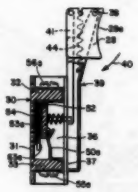
an actuating member movably mounted in said second outer section and including actuating sections directly engaging the tension members to move the tension members relative to the compression member when an actuating force is applied to the actuating member to further stress the spring blade contact member and move the movable contact member out of electrical engagement with the one stationary contact section with a snap action.

4,523,065

TRIGGER OPERATED PANIC SAFETY SWITCH

Merel A. Heggelund, 314 N. Powers Ave., Manteca, Calif. 95336

Filed Oct. 3, 1983, Ser. No. 538,115
Int. Cl.³ H01H *21/26*
U.S. Cl. 200—157 **4 Claims**



3. In a portable electrical power tool, a trigger operated panic safety switch comprising:

a switch enclosure having a pair of side walls connected to end walls to form an elongated chamber with an initial portion, an intermediate portion, and an end portion;

an interconnect carrier having an interconnect member and being movable along the length of the elongated chamber in the switch enclosure;

first and second electrical contact members being fixedly positioned within the intermediate portion of the elongated chamber and being spaced from each other to be contacted by the interconnect member;

a trigger member;

a connecting member connecting the trigger member to the interconnect member to translate the movement of the trigger member to a linear movement of the interconnect carrier along the elongated chamber;

said interconnect carrier being in the initial portion and in the end portion of the elongated chamber with its interconnect member away from the first and second contact members, and being in the intermediate portion of the

elongated chamber with its interconnect member electrically connecting the first and second contact member; and

a flat insulator slide member with a detent, said slide member being positioned between one of the contact members and the interconnect carrier to be moved by its interconnect member to have one of the ends of the slide member engage the end wall in the end portion of the elongated chamber of the switch enclosure to have the interconnect member slide on top of the slide member into its detent to be carried by the slide member, and said slide member with its carried interconnect member being movable towards the end wall in the initial portion of the elongated chamber of the switch enclosure to have the other end of the slide member engage the end wall in the initial portion of the elongated chamber of the switch enclosure to have the interconnect member slide out of the detent and off the top of the slide member.

4,523,066

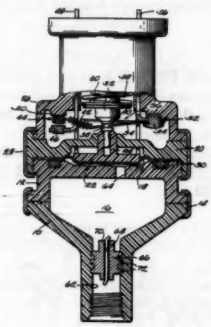
AUTOMOTIVE AIR CONDITIONING SYSTEM CONTROLLED BY DAMPED PRESSURE SWITCH

Charles D. Orth, Lake Forest, Ill., assignor to The Singer Company, Stamford, Conn.

Division of Ser. No. 355,628, Mar. 8, 1982,. This application Jul. 6, 1984, Ser. No. 628,669

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 S **6 Claims**



1. A pressure switch having a diaphragm mounted in a housing to move in response to pressure changes in a chamber communicating with an inlet, movement of the diaphragm being operative to actuate a switch, wherein the improvement comprises:

a partition between the inlet and the chamber,

a hole in the partition, and

a pin mounted in the hole with clearance between the pin and the hole, the clearance being a restricted passage retarding pressure change in the chamber when pressure at the inlet changes rapidly.

4,523,067

TEMPERATURE GRADIENT ZONE MELTING APPARATUS

Roger H. Brown, Burbank; Kuen Chow, Thousand Oaks; Norman W. Goodwin, Encino, and Jan Grinberg, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 9, 1982, Ser. No. 366,901

Int. Cl.³ H05B *6/10*

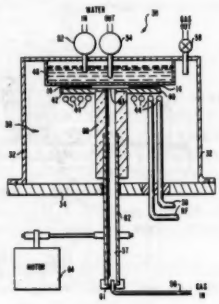
U.S. Cl. 219—10.49 R **6 Claims**

1. An apparatus for fabricating a semiconductor wafer by thermal gradient zone melting, said wafer body having generally parallel opposed top and bottom surfaces, said apparatus comprising:

(a) a base;

(b) a rotatable heating means mounted on said base, said heating means having a generally planar heating surface which is capable of supporting the entire area of the bottom surface of the semiconductor wafer, which aids in establishing a substantially uniform thermal temperature gradient through said wafer such that said bottom surface of said wafer is maintained at a higher temperature than said top surface;

(c) a source of heat conductive gas;



(d) heat sink means sufficiently spaced from the heating means but in close proximity therewith, such that a semiconductor wafer placed on said heating means forms a minimal space between said heating means and said heat sink means, said space capable of receiving a high heat conductive gas, such that said heat sink means and said gas cooperatively remove heat from within said wafer body through the top surface of said semiconductor wafer to enhance the establishment of a thermal temperature gradient; and

(e) means for providing entry and exit of said heat conductive gas to and from said space.

4,523,068

APPARATUS AND METHOD FOR FUSING BATTERY TERMINALS

David L. Lund, Minneapolis, Minn.; Senajit J. Majumdar, Niles, Ill.; William E. Mullane, and Louis Krivanek, both of Warren, Ohio, assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed Sep. 19, 1983, Ser. No. 533,080

Int. Cl.³ H05B *6/10*

U.S. Cl. 219—10.53 **23 Claims**

1. An apparatus for fusing lead components of a battery being assembled comprising

a frame,

an induction heating coil,

means for fixedly supporting said induction heating coil in predetermined orientation with respect to said frame,

a mold insert disposed in concentric relation to said induction heating coil, said mold insert having a mold cavity for receiving said battery components to be fused,

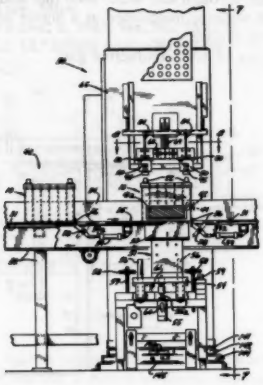
means for automatically locating said battery components to be fused in position below said mold,

means for automatically raising said battery components into said mold cavity and into operative relation to said induction heating coil,

means for generating high frequency oscillating current in said coil,

induced current concentrating means disposed in concentric relation to said induction heating coil for concentrating an induced current flow in said battery components posi-

tioned in operative relation to said coil for heating, melting and fusing said battery components together and molding said components in finished fused form in response to the generation of a high-frequency oscillating current in said coil while the surrounding non-lead components of the battery being assembled remain substantially unaffected,



said induction heating coil including a plurality of vertically arranged turns, said mold insert being supported by at least one of the turns of said coil, and said induced current concentrating means being supported by at least one other of said turns, and

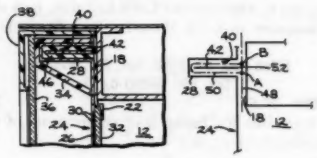
means for automatically lowering and removing said battery components from said mold cavity following fusing and molding thereof to finished form.

4,523,069

MICROWAVE OVEN DOOR SEAL

James E. Staats, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 24, 1983, Ser. No. 544,799
Int. Cl.³ H05B *6/76*
U.S. Cl. 219—10.55 D **21 Claims**



1. In a microwave oven comprising a source of microwave energy having a predetermined frequency and wavelength, an enclosure having located therein a cooking cavity for receiving items to be heated by the microwave energy, the cooking cavity having an access opening, a door for opening and closing the access opening, the door and enclosure defining therebetween a door gap, a door seal arrangement for inhibiting the leakage of microwave energy through the door gap, said door seal arrangement comprising:

one of the door and the enclosure defining an electrically conductive planar surface generally parallel to the plane of the door in its closed position;

the other of the door and enclosure having an electrically conductive channel member defining a recessed channel, said planar surface and said channel member each extending in juxtaposition with each other with the door in its closed position about the periphery of the access opening;

microwave pervious electrical insulation means interposed between said channel member and said planar surface, said insulation means and said channel member cooperating with said planar surface to define a first transmission path for microwave energy propagating through the door gap;

a transmission member disposed within said recessed channel and extending along the length thereof, said transmission member and said channel member establishing a second transmission path for microwave energy propagating through the door gap, said second path intersecting said first path at an inner intersection relatively near the cavity and at an outer intersection relatively remote from the cavity;

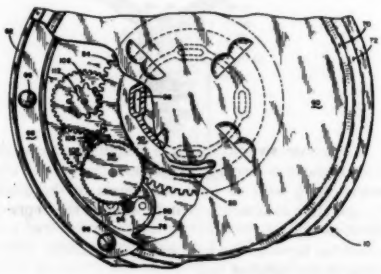
said first and second paths being configured proximate said inner intersection to split therebetween energy propagating through the door gap from the cavity and to recombine energy propagating along said second path with energy propagating along said first path proximate said outer intersection, the effective electrical length between said inner and outer intersections measured along said second path differing from the distance between said intersections measured along said first path such that proximate said outer intersection, energy from one of said paths differs in phase relative to that from the other path by approximately a half wavelength whereby upon recombination, energy from one of said paths substantially cancels energy from the other one of said paths, effectively inhibiting energy leakage beyond the door gap.

4,523,070

LOW PROFILE FOOD ROTATOR

Jorgen A. Jorgensen, Bloomington, and Donald W. Nygren, St. Louis Park, both of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.

Filed Jun. 16, 1983, Ser. No. 505,370
Int. Cl.³ H05B *6/80*; **A47B** *11/00*
U.S. Cl. 219—10.55 F **9 Claims**



1. A portable turntable for use in a microwave oven, comprising:

(a) a generally cylindrical housing member having a planar bottom, a cylindrical side wall projecting upwardly therefrom and an annular cover joined to the upper edge of said side wall defining a central opening in the top of said cylindrical housing;

(b) a toroidal spring case secured to said planar bottom of said housing member, a central opening in said toroidal spring case, said spring case central opening being of a predetermined diameter;

(c) a first gear member having gear teeth on the peripheral edge thereof and a central shaft projecting from a first major surface thereof, said shaft being journaled for rotation within said central opening in said toroidal spring case;

(d) a spiral power spring disposed in said toroidal spring case;

(e) means securing one end of said power spring to said spring case and means releasably connecting the other end of said power spring to said central shaft;

(f) a generally circular turntable member concentrically attached to a second major surface of said first gear member and rotatable therewith;

(g) a gear train comprising a plurality of overlapping gear elements journaled for rotation about vertical axes between said planar bottom and said annular cover of said generally cylindrical housing, one of said gear elements cooperating with said gear teeth on said first gear member; and

(h) means coupled to said gear train for regulating the speed of rotation of said first gear member.

4,523,071

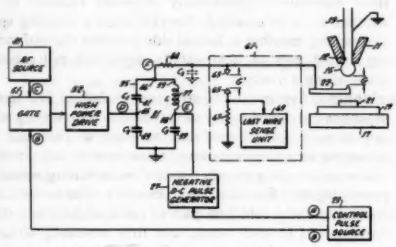
METHOD AND APPARATUS FOR FORMING A BALL AT THE END OF A WIRE

Charles F. Bancroft, Sherman Oaks; Thomas B. Brown; Peter W. Bullock, both of Vista, and Leroy V. Sutter, Jr., Culver City, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 14, 1984, Ser. No. 610,158

Int. Cl.³ B23K *9/06*

U.S. Cl. 219—56.22 **32 Claims**



1. A method of forming a ball at the tip of a wire preparatory to joining said wire tip to another surface, comprising the steps of:

a. initiating an electric arc to said wire tip by subjecting it concurrently to an RF electric field and a DC electric field, and

b. maintaining said arc by continuing to subject said wire tip to said RF electric field after removing said DC electric field.

4,523,072

PRODUCTION OF ELECTRICAL RESISTANCE WELDED STEEL TUBES WITH WELDS HAVING IMPROVED TOUGHNESS

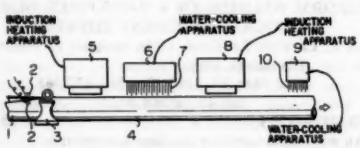
Hiroshi Nakate; Masatoshi Kondo, and Nobuyuki Gosho, all of Wakayama, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Sep. 2, 1983, Ser. No. 528,782

Claims priority, application Japan, Sep. 4, 1982, 57-154225; Sep. 4, 1982, 57-154226

Int. Cl.³ B23K *11/08*

U.S. Cl. 219—67 **15 Claims**



1. A process for producing an ERW tube having welds which have been improved in toughness without adversely affecting the toughness of the parent metal of the tube, which comprises forming a continuous low alloy steel strip into a tubular shape through a series of forming rolls, continuously carrying out electrical resistance welding of a seam which is formed from opposite side edges of the strip and which extends in a longitudinal direction to produce an electrical resistance welded tube, heating the welds of the thus obtained electrical resistance welded tube to a temperature not lower than the A_{c3} point, then cooling the heated welds at cooling rate of 15°–30° C./sec at least between 800° C. and the A_{r1} point to obtain a metallurgical structure of bainite plus fine ferrite, and tempering the thus cooled welds of the tube at a temperature of 450°–800° C.

4,523,073

WIRE-CUT ELECTRIC DISCHARGE MACHINE CONTROLLER FOR COMPENSATING THE MACHINING CORNERING PARAMETERS

Gotaro Gamo; Mitsuo Kinoshita, both of Hachioji, and Haruki Obara, Sagamihara, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

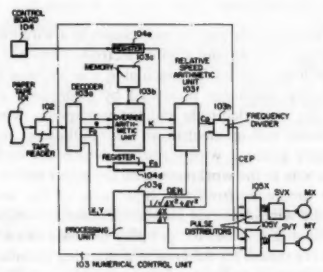
PCT No. PCT/JP81/00421, § 371 Date Aug. 25, 1982, § 102(e) Date Aug. 25, 1982, PCT Pub. No. WO82/02355, PCT Pub. Date Jul. 22, 1982

PCT Filed Dec. 28, 1981, Ser. No. 413,383

Claims priority, application Japan, Dec. 30, 1980, 55-186736

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **3 Claims**



1. A method of controlling a wire-cut electric discharge machine, operatively connected to receive radius of curvature data, corner angle data, thickness data of the workpiece, and a commanded feeding speed which comprise cutting command data, by applying a voltage between a wire electrode and an electrically conductive workpiece for cutting the electrically conductive workpiece to a predetermined shape with electric discharge energy while the wire electrode and the workpiece are being moved relative to each other based on the cutting command data to cut the workpiece to the predetermined shape, said method comprising the steps of:

(a) determining an amount of override, which is the amount the commanded feeding speed is adjusted in dependence upon the radius of curvature data of the corner of the workpiece, the thickness data and the corner angle data;

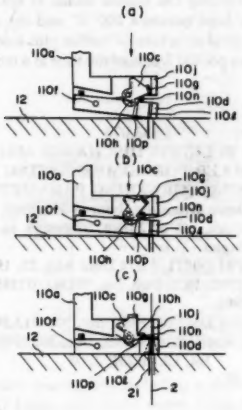
(b) determining a relative feeding movement speed between the workpiece and the wire electrode, based on the radius of curvature data of the corner of the workpiece, corner angle data, the thickness data and the commanded feeding speed which comprise the cutting command data, and the amount of override, when cutting the corner; and

(c) moving the workpiece and the wire electrode relative to each other at the relative feeding movement speed, which is lower than the commanded feeding speed, for electric discharge cutting of the corner.

4,523,074
WIRE ELECTRODE PULL-UP MECHANISM IN WIRE-CUT ELECTRIC DISCHARGE MACHINE

Kanemasa Okuda, Hino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

Filed Sep. 29, 1982, Ser. No. 428,288
Claims priority, application Japan, Oct. 2, 1981, 56-157190
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W 8 Claims



1. A wire electrode pull-up mechanism in a wire-cut electric discharge machine having a wire electrode stretched between upper and lower guides for machining a workpiece by means of an electric discharge produced by impressing a voltage between the wire electrode and the workpiece, wherein the wire electrode pull-up mechanism is for pulling up, on the side of the upper guide, a wire electrode which has been passed through a bore in the workpiece until the upper end of the wire electrode protrudes from the upper side of the workpiece, wherein the wire electrode pull-up mechanism comprises:

(a) a gripping member for gripping the wire electrode, and

(b) a drive means for moving said gripping member up and down relative to the workpiece,

wherein the gripping member includes:

(i) an arm having a bearing wall at the distal end thereof,

(ii) a clamping member pivotally provided on said arm and having a cam body and a restraining portion for abutting against the bearing wall of said arm,

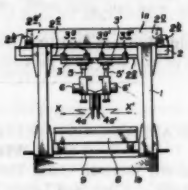
(iii) a spring means for urging said clamping member in such a manner that the restraining portion thereof abuts against said bearing wall, and

(iv) an operating member pivotally provided on said arm and having a cam operating portion abutting against the cam body of said clamping member for pivoting said clamping member, said operating member being pivoted owing to pressured contact with the upper surface of the workpiece when said gripping member is lowered into abutting contact with the upper surface of the workpiece by said drive means, wherein said clamping member is pivoted by said cam operating portion as said operating member abuts against the workpiece, in such a manner that said clamping member causes a gap to be formed between said restraining portion and said bearing wall, and wherein said operating member separates from the workpiece when said arm is raised, whereby said clamping member is pivoted by said spring means so that the upper end of the wire electrode, inserted into said gap, is retained between the restraining portion of said clamping member and the bearing wall of said arm.

4,523,075
RESISTANCE WELDING APPARATUS

Hitoshi Horii, and Yutaka Oonishi, both of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Japan

Filed Aug. 1, 1983, Ser. No. 519,312
Claims priority, application Japan, Jul. 31, 1982, 57-116858[U]
Int. Cl.³ B23K 11/10
U.S. Cl. 219—88 11 Claims



1. A resistance welding device for welding a pair of superposed weldable members together at a plurality of welding points disposed in a matrix configuration, said welding device comprising in combination:

a base structure including vertically separated ceiling and floor members superjacently disposed relative to one another so as to establish therebetween a welding space, said ceiling member at lateral side portions thereof including a first pair of horizontally separated rail members establishing a y-axis;

an elongated first mounting structure including first mounting means to dependently mount said first mounting structure to said first pair of rail members so that said first mounting structure is disposed transverse to said y-axis yet below said ceiling member, said first mounting means for permitting said first mounting structure to be reciprocially moveable along said first pair of rail members in a direction parallel to said y-axis, said first mounting structure along its longitudinal length including a second pair of horizontally separated rail members establishing an x-axis transversely oriented relative to said y-axis established by said first pair of rail members;

a pair of electrode gun means each including at least one electrode tip for welding said superposed weldable members at said plurality of matrix-configured welding points;

second mounting means to dependantly mount each said pair of electrode gun means to said second pair of rail members so that each of said electrode gun means is dependantly supported in said welding space below said first mounting structure, said second mounting means permitting each said pair of electrode gun means to be moveable along said x-axis so as to displacable towards and away from one another; and

jig truck means movable into and out of said welding space for establishing a platform to support said weldable members in confronting relationship to said at least one electrode tip of each said electrode gun means to thereby permit welding thereby at said matrix-configured welding points.

4,523,076
AUTOMATIC WELDING MACHINE WHICH PROVIDES UNIFORM WELDING OF A WORKPIECE DURING VERTICAL MOVEMENT THEREOF

Charles R. Laymon, Loveland, Ohio, assignor to Welco Industries, Inc., Cincinnati, Ohio

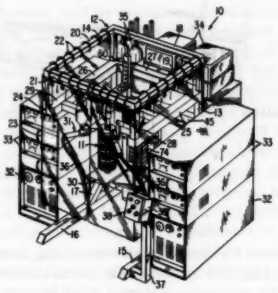
Filed Mar. 21, 1983, Ser. No. 477,063
Int. Cl.³ B23K 9/12
U.S. Cl. 219—125.1 13 Claims

1. An automatic welding machine comprising:

(a) a base frame;

(b) a vertical slideway formed on said base frame;

(c) a work slide assembly supported on said slideway for vertical movement therealong, said work slide assembly having a mounting axis for a workpiece disposed parallel to and spaced from said slideway;
(d) antifriction means between said work slide assembly and slideway;
(e) means for supporting said workpiece at opposite ends thereof on said mounting axis of said work slide assembly;
(f) a welding head supported on said base frame at a fixed vertical position along said slideway, said welding head having means for welding said workpiece;



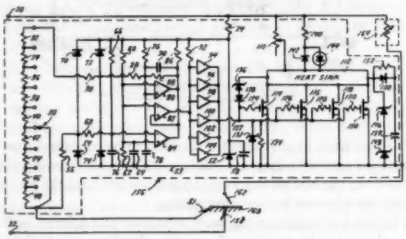
(g) means for maintaining said welding head at a controlled space from said workpiece; and
(h) means for moving said work slide assembly and said workpiece supported thereon along said slideway during simultaneous operation of said welding means to provide weld bead means on said workpiece, said moving means and antifriction means cooperating to provide smooth movement of said workpiece and thereby assure said welding means provides said weld bead means which is uniform.

4,523,077

ELECTRIC ARC WELDER THAT PROVIDES NON-STICKING ARC INITIATION AND THEREAFTER MAINTAINS THE ARC

Harold C. Hoyt, Jr., Spanish Lake, Mo.; Danilo C. Martinez, Clearwater, Fla., and Stanley M. Philipak, Overland, Mo., assignors to Big Four Manufacturing Company, Inc., O'Fallon, Mo.

Filed Jun. 16, 1983, Ser. No. 505,097
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—137 PS **28 Claims**



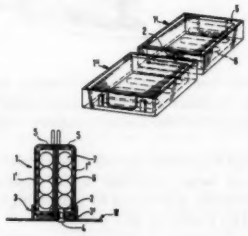
1. An electric arc welder that is connectable to a source of power and to a welding electrode and to a work piece and that comprises current-conducting means connectable to said source of power to maintain a continuous arc between said welding electrode and said work piece, while selectively supplying power to said arc along a first predetermined volt-ampere curve or along a second and distinctly-different predetermined volt-ampere curve, a sensing circuit which can sense the voltage across said arc and which develops a predetermined signal whenever said voltage across said arc falls below a predetermined value, and a control circuit that can coact with said sensing circuit to permit said current-conducting means to supply welding power to said arc along said first predetermined volt-ampere curve whenever said voltage across said arc is at or above said predetermined value, said control circuit responding to said predetermined signal from said sensing circuit to cause said current-conducting means to supply welding power to said arc along said second and distinctly-different predetermined volt-ampere curve whenever said voltage across said arc is below said predetermined value, said first predetermined volt-ampere curve having a corresponding power curve of a predetermined magnitude, said second and distinctly-different predetermined volt-ampere curve having a corresponding power curve of a greater predetermined magnitude, whereby the amount of welding power which can be supplied to said arc is greater when said current-conducting means is supplying welding power to said arc along said second and distinctly-different predetermined volt-ampere curve than when said current-conducting means is supplying welding power to said arc along said first predetermined volt-ampere curve, and said control circuit causing said current-conducting means to shift from the supplying of welding power along said first predetermined volt-ampere curve to the supplying of welding power along said second and distinctly-different predetermined volt-ampere curve so rapidly that the shift is from a point on said first predetermined volt-ampere curve to a point of substantially equal potential but very substantially larger current on said second and distinctly-different predetermined volt-ampere curve, said current-conducting means being dimensioned to supply power to said arc at levels which are great enough to do welding whenever said voltage across said arc is at or above said predetermined value and also to repeatedly supply greater values of current of momentary duration to said arc to continue to do welding whenever said voltage across said arc falls below said predetermined value during zero-going voltage spikes.

4,523,078

PORTABLE ELECTRICALLY HEATED WARMING CONTAINER FOR TRANSPORTING INFUSIONS IN A RESCUE VEHICLE

J. C. Ludwig Lehmann, Lorch, Fed. Rep. of Germany, assignor to Binz GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 174,747, Aug. 4, 1980, abandoned. This application Feb. 1, 1983, Ser. No. 463,060
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 7922217[U]
Int. Cl.³ H05B *1/00;* **A47J** *36/24*
U.S. Cl. 219—202 **5 Claims**



1. A warming container arrangement for transporting of infusions or the like in a rescue vehicle, comprising a thermally insulated warming container case having a flat bottom wall and an interior space for receiving a plurality of containers to be warmed and an electrical heater operable by connection to the

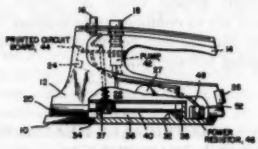
electrical system of a vehicle for warming containers received in said interior space, and a trough-shaped transport casing adapted to be fixedly installed in a vehicle and having a flat bottom wall and side walls which are low compared to the height of container case and which side walls define at least one receiving space open at the top side to at least partially snugly surround the warming container case in a manner securing same against sliding and tipping, wherein said electrical heater is detachably connectable to the electrical system of the vehicle by an electrical connecter having a plug-in electrical connector member adapted to be electrically connected to a vehicle power supply disposed on the bottom wall of the transport casing and by a complementary electrical connector member connected to said electric heater and positioned in a recess in the bottom wall of the case so as to be flush with the exterior bottom wall surface of the case and accessible externally thereof for receiving said plug-in electrical connector member upon insertion of said warming container case into said receiving space of the transport casing through said open top of said casing, said side walls of said casing acting in conjunction with the side walls of the case to guide a plug-in connector member and complementary electrical connector member into engagement as the case is inserted into the casing.

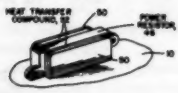
4,523,079

ELECTRIC IRON HAVING ELECTRONIC CONTROL CIRCUIT WITH A POWER RESISTOR MOUNTED ON THE SOLEPLATE

Harry Albinger, Jr., Monroe, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 20, 1983, Ser. No. 533,933
Int. Cl.³ H05B *1/02*; D06F *75/18, 75/26*
U.S. Cl. 219—251 **7 Claims**





1. An electric iron comprising a housing shell forming a hollow handle structure and a heat generating soleplate, said shell, including said hollow handle structure being open to said soleplate,

low DC voltage electronic circuit control means including a printed circuit board disposed in the housing shell away from the soleplate, and means to reduce high AC line voltage to low DC supply to said circuit,

said means including a connected power resistor, said printed circuit board being directly exposed to heat from said power resistor,

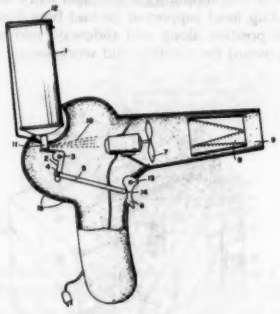
means mounting said resistor on said soleplate, in a thermally close coupling thereto, whereby the hot soleplate forms a heat sink to dissipate resistor heat preventing excessive heating of the printed circuit board.

4,523,080

APPARATUS FOR TREATMENT OF HAIR AND SCALP

John D. Bolton, 5 Shiloh Cir., Irvine, Calif. 92714

Filed Mar. 14, 1983, Ser. No. 444,422
Int. Cl.³ A45D *7/02, 20/09*; B05B *7/16*
U.S. Cl. 219—362 **1 Claim**



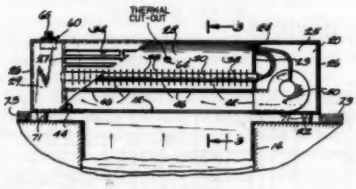
1. Apparatus for treating hair comprising, a hand held hair dryer having an air inlet and an air outlet, blower means in the hair dryer for producing a stream of air between the air inlet and the air outlet, attaching means for attaching an aerosol spray can to the hair dryer between the air inlet and the blower means so that aerosol spray leaving a nozzle of the aerosol spray can contact said stream of air between the blower means and the air inlet, whereby the blower means thoroughly mixes said stream of air and said aerosol spray, heater means between the blower means and the air outlet to the said mixed stream of air and aerosol spray, and manual trigger means on the hair dryer and connected to the aerosol spray can for controlling the flow of said aerosol spray into said stream of air.

4,523,081

FORCED AIR BASEBOARD HEATER AND AIR DUCT DIFFUSER

Henry T. Geib, Sr., Ixonia, and Wayne C. Griffith, Hartland, both of Wis., assignors to M. P. Metal Products, Inc., Ixonia, Wis.

Filed Dec. 27, 1982, Ser. No. 453,482
Int. Cl.³ F24F *5/00*; F24H *3/04, 9/02*; H05B *3/40*
U.S. Cl. 219—370 **1 Claim**



1. A portable electric heater adapted to be mounted over the discharge end of a hot air duct to diffuse air flowing into a room from the hot air duct and to selectively heat the air in the room, the electric heater comprising

a housing including a top wall, a bottom and a front wall and adapted to be positioned over the discharge end of the hot air duct, the housing including an elongated air inlet in said bottom, said air inlet being positionable over the discharge end of the hot air duct whereby air from the discharge end of the hot air duct can flow into the housing, and the housing including an air outlet opening, and an elongated chamber therein, said chamber including opposite ends,

an elongated electrical resistance heating element housed in said chamber and extending substantially along the length of said chamber, and

means for forcing air upwardly across said elongated heating element along a substantial portion of the length of said heating element and toward said air outlet opening of said housing, said means for forcing air across said elongated heating element including

means defining an air conduit positioned in said housing in parallel spaced relation from said elongated heating element and extending along the length of said elongated heating element, said air conduit comprising an elongated tube having opposite ends and said elongated tube being positioned adjacent said elongated air inlet of said housing, air outlet means along the length of said elongated tube, said air conduit air outlet means being adjacent said heating element and facing said elongated heating element whereby air flowing through said elongated tube is discharged toward said elongated heating element, and

means for forcing air through said air conduit and through said air outlet means toward said elongated heating element, said means for forcing air through said elongated tube including a centrifugal fan contained in an end of said housing and connected to one of said ends of said elongated tube for forcing air into said elongated tube.

4,523,082

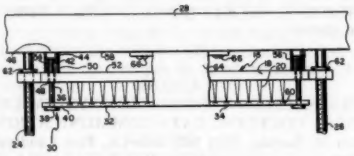
ELECTRODE SHIELD DEVICE

Eugene J. Sturdevant, P.O. Box 5327, Wilmington, Del. 19899

Filed May 5, 1983, Ser. No. 491,746

Int. Cl.³ H01T *19/04*; A21B *1/02*; F27D *11/12*

U.S. Cl. 219—399 **12 Claims**



9. An electrode shield device in an oven appliance having an electrode means, the shield device comprising in combination;

a movable electrode having a plurality of needles projecting from a base;

a drive means coupled to said movable electrode for moving said movable electrode from a first location near an internal top surface of the oven to a second location spacing said movable electrode further away from said internal top surface;

a shield member having a surface area sufficient to cover said plurality of needles; and

means carried by said movable electrode for supporting said shield member adjacent said needles and parallel to said base, said means supporting said shield member operative in a first position for rigidly locating said shield member away from said base to prevent physical contact with the needles when said movable electrode is in said first location and in a second position for locating said shield member engaging said base to expose said needles from said shield member when said movable electrode is in said second location.

4,523,083

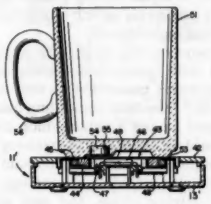
BEVERAGE WARMER

William H. Hamilton, Seattle, Wash., assignor to Hamilton-Dunn Research Co., Seattle, Wash.

Continuation-in-part of Ser. No. 288,113, Jul. 29, 1981, abandoned. This application Apr. 2, 1984, Ser. No. 596,063

Int. Cl.³ F27D *11/02*

U.S. Cl. 219—433 **33 Claims**



1. A beverage warmer comprising electric-heater means having an electrically heated non-magnetic surface, an energizing electrical circuit for said means having a magnetically operable normally open switch mounted adjacent said surface in a predetermined location, and a non-magnetic beverage container having a closed bottom with a periphery adapted for stabilized removable mounting on said surface, said container having thereon a magnet near one to the exclusion of another region of said periphery, said switch being locally responsive to said magnet to close for a mounted condition of said container when said container is oriented to place said one region in operative proximity to said switch, and said switch being sufficiently non-responsive to said magnet to thereby remain open when said container is oriented to place said other region in proximity to said switch.

4,523,084

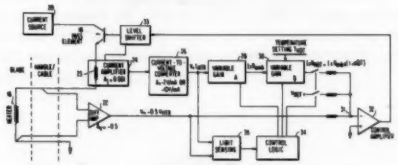
CONTROLLER FOR RESISTIVE HEATING ELEMENT

Paul S. Tamura, Palo Alto, and Robert J. Strehlow, Mt. View, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Filed Sep. 2, 1981, Ser. No. 298,796

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **16 Claims**



1. An apparatus for controlling the flow of current from a current source through a resistive heating element disposed on a surgical scalpel such that the resistive heating element is heated from an ambient temperature to a predetermined temperature, said apparatus comprising:

voltage measuring means for sensing the magnitude of the voltage drop across the resistive heating element and for generating a voltage-representative signal having a value corresponding to the magnitude of the voltage drop so sensed;

current measuring means for sensing the magnitude of current flowing through the resistive heating element and for generating a current-representative signal having a value corresponding to the magnitude of the current so sensed;

resistance computing means for generating a computed

resistance signal having a value corresponding to the predicted resistance of the heating element at the predetermined temperature, said resistance computing means including a calibration means which produces a first signal for use in generating said computed resistance signal, said first signal having a value corresponding to the resistance of the resistive heating element at the ambient temperature, said resistance computing means also including a temperature parameter means which produces a second signal for use in generating said computed resistance signal, said second signal having a value corresponding to a temperature parameter which varies as a function of the predetermined temperature;

ratio comparision circuit means for generating a control signal, said ratio comparison circuit means including a multiplying means connected to said current measuring means and said resistance computing means for deriving a product signal having a value which corresponds to the product of said values of said current-representative signal and said computed resistance signal, said ratio comparison circuit means also including a summing means connected to said multiplying means and said voltage measuring means for combining said product signal with said voltage-representative signal in order to generate said control signal; and

means connected to receive said control signal for regulating the flow of current between the current source and the resistive heating element in response to the magnitude of said control signal.

4,523,085

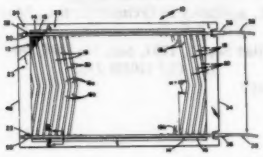
ELECTRICAL HEATING DEVICE

Frederick G. J. Grise, Osterville, Mass., assignor to Flexwatt Corporation, Canton, Mass.

Continuation-in-part of Ser. No. 295,000, Aug. 21, 1981, Pat. No. 4,485,297, which is a continuation-in-part of Ser. No. 181,074, Aug. 28, 1980, abandoned. This application Jan. 20, 1984, Ser. No. 572,678

Int. Cl.³ H05B *3/34*

U.S. Cl. 219—528 **14 Claims**



1. An electrical heating device comprising

an elongated conductor,

a semi-conductor pattern electrically connected to and extending from said conductor, and

electrically insulating sealing layers on top of and below said conductor and said semi-conductor pattern,

said device being characterized in that:

said conductor comprises a pair of rectangular in cross-section metallic conductor elements, placed one on top of the other in face-to-face engagement with and unattached to each other, the bottom one of said conductor elements facing towards one of said sealing layers and the upper one of said conductor elements facing towards and engaging the other of said sealing layers,

the upper one of said conductor elements adjacent an end of said device is folded back longitudinally upon itself to expose an upper surface of the lower one of said conductor elements and a lower surface of the upper one of said conductor elements, and

a wire engages and is electrically connected to at least one of the thus exposed upper surface of said lower one of said conductor elements and the thus exposed lower surface of said upper one of said conductor elements.

4,523,086

FLEXIBLE ELECTRICAL THERMAL ELEMENT

Heinz Eilentropp, Wipperfürth, Fed. Rep. of Germany, assignor to HEW Kabel, Heinz Eilentropp KG, Wipperfuerth, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,631

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1982, 3233904; Sep. 13, 1982, 3233928; Nov. 22, 1982, 3243061

Int. Cl.³ H05B *3/56*

U.S. Cl. 219—549 **9 Claims**

1. Flexible element for one of the following, heating and temperature measurement, and to be made on a continuous basis so that a desired length can be cut therefrom, comprising, feeder lines each having an electrically conductive core and an electrically insulating layer thereon; and a respective heating conductor being interlooped in interweaving fashion with the feeder lines whereby the heating conductor loops around the feeder lines individually for obtaining a meshlike coherent configuration there being discrete locations of the feeder lines, from which the insulation layer thereof has been removed and making contact with the respective heating or measuring conductor thereat.

4,523,087

TRANSACTION VERIFICATION SYSTEM USING OPTICAL COUPLING DATA COMMUNICATION LINK

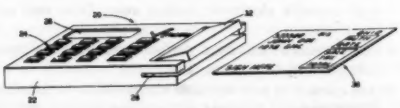
William M. Benton, 2888 NE. 25th Ct., Fort Lauderdale, Fla. 33305

PCT No. PCT/US81/00450, § 371 Date Dec. 7, 1982, § 102(e) Date Dec. 7, 1982, PCT Pub. No. WO82/03484, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 7, 1981, Ser. No. 451,169

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 **10 Claims**



1. A system for determining whether a requested transaction is authorized, comprising

a portable verification device to be carried by a user, said device comprising a housing, data processing and storage circuit means inside said housing; a keyboard for providing monodirectional first transaction data to said circuitry and a first optical transceiver exposed through said hous-

ing for providing bidirectional second transaction data to said circuitry;

a console at a point of transaction location, including a receptacle for receiving said verification device, a second optical transceiver within said receptacle position to establish an optical communication link with said first optical transceiver, said receptacle including means for maintaining said first and second optical transceivers in proper optical registration with each other and

means responsive to keyboard entered data and stored data for establishing transaction authorization data on said optical link.

4,523,088

CODE BAR FOR IDENTIFICATION OF SERIES PARTS

Joachim Utsch, Alte Dreisbachstrasse 19, D-5900 Siegen 31, and Theo Morgenschweis, Am Altenberg 8, D-5908 Neunkirchen 3, both of Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 495,076

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218223

Int. Cl.³ G06K *13/107*

U.S. Cl. 235—487 **3 Claims**

1. Code bar for the identification of series parts, for example vehicle bodies, within an assembly line, with several codings in the form of alternating bright and dark stripes of differing widths, corresponding respectively to the digits 0 through 9, characterized in that the code bar (1) is a sheet-metal strip (2, 2') from which the dark stripes (6, 7) of the codings (4) are punched out as slots.

4,523,089

DRIVING APPARATUS FOR SEMICONDUCTOR LASER

Takeshi Maeda, Kokubunji; Yasumitsu Mizoguchi, Odawara; Masahiro Takasago, Odawara; Tokuya Kaneda, Odawara, and Yoshito Tsunoda, Mitaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,809

Claims priority, application Japan, Sep. 4, 1981, 56-138582

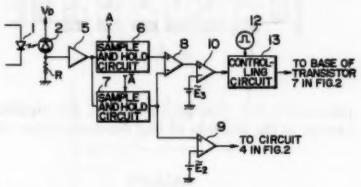
Int. Cl.³ G01J *1/32;* **H01S** *3/10*

U.S. Cl. 250—205 **4 Claims**

1. An apparatus for driving a semiconductor laser, comprising: a DC bias current source for generating a DC current applied to said semiconductor laser; a pulse generating source for producing pulses superposed onto said DC current; a photo detector for receiving laser light emitted by said semiconductor laser; first means for monitoring the output signal of said photo detector upon application of said DC bias current; and second means for monitoring the output signal of said photo detector upon application of said pulse, wherein the DC output current of said DC bias current source is controlled by utilizing the output signal of said first means, while the pulse current output of said pulse generating source is controlled by using the output signal of said second means,

wherein said first means includes a first sample and hold circuit for sampling and holding the output signal of said photo detector during a period in which said DC bias current is applied, and first comparison means for comparing the output signal of said first sample and hold circuit with a first predetermined reference value, and

wherein said second means includes a second sample and hold circuit for sampling and holding the output signal of



said photo detector during a period in which said pulse current is applied, a differential circuit for deriving difference between the output signals of said second sample and hold circuit and said first sample and hold circuit, and second comparison means for comparing the output signal of said differential circuit with a second predetermined reference value.

4,523,090

LIGHT CONTROLLED FADER

Warren E. Wagner, P.O. Box 12025, Memphis, Tenn. 38122

Filed Jun. 20, 1983, Ser. No. 506,706

Int. Cl.³ H01L *31/08*

U.S. Cl. 250—211 K **6 Claims**

1. A light controlled fader for providing an analog voltage output, said fader comprising:

(a) a first light emitting means;

(b) a first light receiving means for receiving light from said first light emitting means and for providing a voltage output proportional to the amount of light received from said first light emitting means;

(c) a second light emitting means;

(d) a second light receiving means for receiving light from said second light emitting means and for producing a voltage output proportional to the amount of light received from said second light emitting means; and

(e) control means for varying the amount of light received by said first and second light receiving means from said first and second light emitting means in an inverse proportion to one another.

4,523,091

RADIATION DETECTING APPARATUS WITH REDUCED MAGNETIC FIELD SENSITIVITY

Dennis E. Persyk, Barrington, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 22, 1982, Ser. No. 360,338

Int. Cl.³ H01J *31/50*

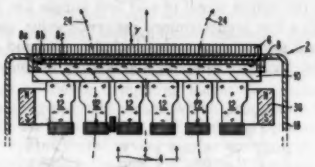
U.S. Cl. 250—213 VT **10 Claims**

1. A radiation detection apparatus containing

(a) at least one photomultiplier tube for the detection of light, said photomultiplier tube being exposed to a perturbing magnetic field; and

(b) means for superimposing an artificial magnetic field on said perturbing magnetic field at the location of said photomultiplier tube wherein the strength of said artificial magnetic field is greater than the strength of said perturb-

ing magnetic field, such that a change of said perturbing magnetic field due to a change of the position of said



photomultiplier tube does not cause any significant field change at the location of said photomultiplier tube.

4,523,092

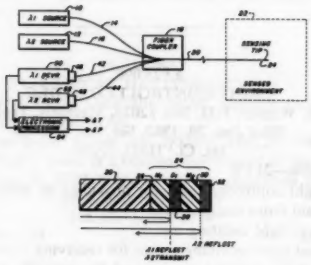
FIBER OPTIC SENSORS FOR SIMULTANEOUSLY DETECTING DIFFERENT PARAMETERS IN A SINGLE SENSING TIP

Arthur R. Nelson, Stow, Mass., assignor to Aetna Telecommunications Laboratories, Westboro, Mass.

Filed Jul. 29, 1982, Ser. No. 403,125

Int. Cl.³ G01D *5/26*

U.S. Cl. 250—227 **18 Claims**



1. A sensor system for simultaneously sensing at least two different parameters and utilizing selective absorption of a plurality of frequencies by different optical layers comprising:

an optical fiber;

means for applying radiation of a plurality of optical frequencies to said fiber;

said optical fiber having a termination operative to reflect said radiation of plural frequencies back through said optical fiber;

said termination including at least two contiguous and sequential semiconductor layers each having an optical absorption curve at a distinct wavelength wherein the absorption is a function of a parameter being sensed; and

means responsive to reflected radiation in said fiber for analyzing the reflected radiation at said plurality of frequencies to provide an indication of the value of the respective parameters.

4,523,093

SCANNING BEAM REFERENCE AND READ SYSTEM

Don B. Neumann, Laguna Beach, Calif., assignor to Excellon Industries, Torrance, Calif.

Continuation-in-part of Ser. No. 298,907, Sep. 3, 1981, Pat. No. 4,447,723. This application Aug. 20, 1982, Ser. No. 409,906

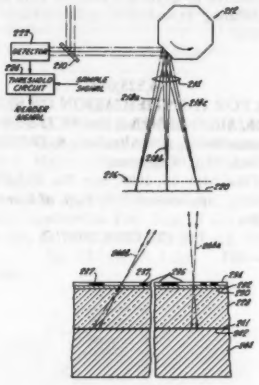
Int. Cl.³ H01J *3/14*

U.S. Cl. 250—234 **20 Claims**

5. In an optical reader for reading a transparent document, such as a sheet of text or drawing having a pattern of transparent and opaque areas, and wherein an optical beam is scanned across the document to be read and reflected light is collected to provide a representation of the pattern of transparent and opaque areas on the document to be read, an improved method of collecting light comprising the steps of

detachably positioning a body of retroreflective material at one side of the document to be read,

transmitting said optical beam through the document to the retroreflective material so that light received by the retroreflective material is retroreflected back through the document,



precisely locating said optical beam in its scan, and

collecting light retroreflected from said material back through the document to provide reader signals at points on the document along the optical beam scan denoting whether the document is transparent or opaque at such points, said reader signals collectively indicating the pattern of transparent and opaque areas on the document.

4,523,094

EVALUATION DEVICE FOR ELECTRON-OPTICAL IMAGES

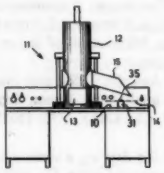
Eberhard Rossow, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 345,387, Feb. 3, 1982,. This application Feb. 8, 1984, Ser. No. 578,126

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 8105611[U]

Int. Cl.³ H01J *37/26*

U.S. Cl. 250—311 **9 Claims**



1. In an electron microscope having an evacuated envelope with a window (13) through which an output-image fluorescent screen (21) of the microscope is observable, the microscope including electron-optical means (22) for projecting a divergent beam of electrons to form an output image upon said screen (21), a device for evaluating electron-optical images by simultaneous observation of the electron-optical image and of a light-optical image; said device comprising means external to said envelope for establishing an image plane (14) of a visible-light plane, a housing (15) attached to and forming part of said

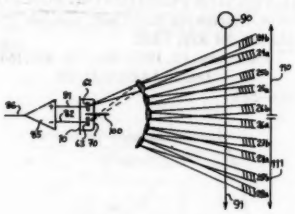
envelope and extending both into and out of said envelope at a location offset from both said screen (21) and said image plane (14), and light-image projecting means carried by said housing and comprising an objective (24) within said housing and a reflector (25) within said envelope and a reflector (23) outside said envelope, said reflectors and objective being positioned to superpose the central ray from the light-image plane (14) upon the intercept of the electron-optical axis with said fluorescent screen (21), and said reflector within said envelope being positioned near said electron-optical means and in clearance with the electron beam whereby to achieve substantial directional conformance of focused electron-optical and of focused light-optical impingement upon said screen.

4,523,095

RADIATION DETECTOR WITH ASYMMETRICAL PATTERN

Christiane Keller-Steinbach, Maennedorf, Switzerland, assignor to Eltec Instrument A.G., Wallisellen-Zurich, Switzerland

Filed Nov. 19, 1982, Ser. No. 443,180
Int. Cl.³ G01J *5/08*; G08B *13/18*
U.S. Cl. 250—349 **7 Claims**



1. A radiation detector for producing a differential signal for either a near field of view or a far field of view, said detector comprising:

a radiation sensor having a pair of side by side sensing elements connected differentially for producing an essentially zero output signal if each of said elements receives equal amounts of radiated energy and in which an output signal occurs when said sensing elements receive unequal amounts of energy;

a radiation shield disposed between and perpendicular to the plane of said sensing elements; and

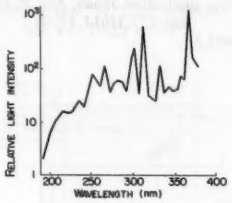
a plurality of optical lens elements disposed in an array adjacent said sensing elements such that a plurality of discrete fields of view is produced with each lens element producing a first field of view associated with one of said pair of said sensing elements and a second field of view associated with the other of said pair of sensing elements, said shield positioned to provide a different sensitivity pattern between said first field of view and said second field of view for each of said lens elements.

4,523,096

LIQUID CHROMATOGRAPHY APPARATUS

Makoto Yasuda, and Seiichi Murayama, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,600
Claims priority, application Japan, Dec. 16, 1981, 56-186348
Int. Cl.³ B01D *15/08*; G01J *3/00*
U.S. Cl. 250—373 **3 Claims**



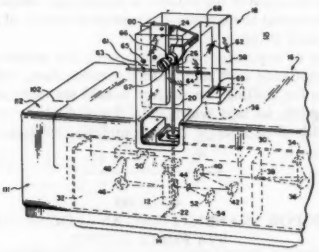
1. A liquid chromatography apparatus comprising detector means having as a light source a metal halide lamp filled with tantalum halide, mercury and rare gas.

4,523,097

METHOD AND APPARATUS FOR REDUCING SCHLIEREN NOISE IN A LIQUID CHROMATOGRAPH

Robert W. Allington, Lincoln, Nebr., assignor to ISCO, Inc., Lincoln, Nebr.

Filed Aug. 31, 1983, Ser. No. 527,954
Int. Cl.³ G01N *31/08*
U.S. Cl. 250—458.1 **22 Claims**



1. A method of operating a liquid chromatograph having at least a chromatographic column, a sample injection valve, and a flow cell comprising the steps of:

applying electrical power to an absorbance detector within an enclosure containing at least the flow cell and a portion of the chromatographic column;

blowing air from the enclosure into an air chamber that encloses a sample injection valve and at least a part of a chromatographic column and recirculating the air from a location near the sample injection valve along the column toward the flow cell until temperature changes with respect to time at each location are within less than 0.1 degree Celsius within the enclosure and chamber within a one minute time period;

passing eluant after the temperature has stabilized through the column and flow cell;

transmitting a beam of light having a wave length within a range of wave lengths of 180 nanometers to 3,000 nanometers through the flow cell from a source of light that varies less than ten percent in intensity in a one minute period; and

detecting changes in the absorbance of light flowing through said flow cell.

4,523,098

ELECTRON BEAM EXPOSURE APPARATUS

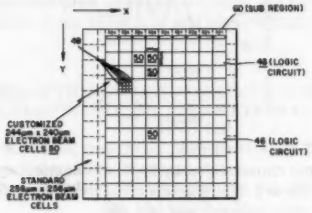
Akira Noma, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 287,813, Jul. 28, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,287

Claims priority, application Japan, Aug. 8, 1980, 55-108917

Int. Cl.³ H01J *37/00*

U.S. Cl. 250—492.2 **6 Claims**



1. An electron beam apparatus for exposing a pattern having a repetitive nature on the surface of a subject with an electron beam having an electron beam scanning direction and comprising:

means for storing data representing the individual width in the beam scanning direction and data representing the pattern content of a plurality of stripes, said stripes dividing the surface of the subject to be exposed in a direction perpendicular to the electron beam scanning direction, with the width of each such stripe independently selected as a function of the pattern to be exposed on the surface of the subject to maxmize the repetitive nature of the pattern in each stripe;

means of exposing each stripe with the electron beam in accordance with said pattern content data; and

means for shifting the subject in said scanning direction in response to said width data, for a distance equal to the width of each stripe upon completion of exposure of that stripe.

4,523,099

DEVICE FOR TRANSMITTING ANALOG SENSOR DATA VIA FIBER OPTICS

Michael K. Lavine, 90 Hadley Village Rd., South Hadley, Mass. 01075

Filed Apr. 29, 1983, Ser. No. 489,769

Int. Cl.³ H04B *9/00*

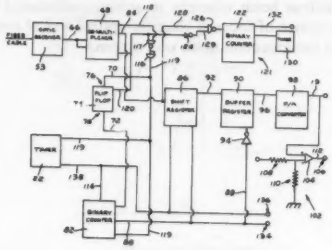
U.S. Cl. 250—551 **7 Claims**

1. A device for transmitting analog sensor data via fiber optics, said device comprising:

(a) a transmission circuit for receiving electrical analog data from a sensor, converting the data into bits of binary information, and transforming the information into light pulses for subsequent transmittal to a receiver circuit, said transmission circuit including an analog-to-digital converter for receiving analog data and converting it into binary information, a shift register connected to the converter for receiving a string of binary information and shifting the information to a light-emitting diode where the information is transformed into light pulses;

(b) a fiber-optic cable having one end attached to the transmission circuit for receiving the light pulses from the light-emitting diode and transmitting them to a receiver circuit;

(c) a receiver circuit, attached to the opposite end of the fiber-optic cable, for receiving the light pulses and converting them back into an analog signal for subsequent transmission to a monitoring device, said receiver unit including a light-receiving diode attached to the fiber-optic cable for receiving the pulses transmitted by the cable, a de-multiplexer connected to the light-receiving diode for handling the data and sending the data to an attached shift register, and a digital-to-analog converter attached to the shift register for receiving a string of data from the shift register, converting the string into an analog signal, and transmitting it to a monitoring system; and,



(d) means for allowing the light-emitting diode of the transmission circuit to be normally kept "off" when no monitoring information is desired by a user, and to be turned "on" only when a new string of monitoring information is desired, said means including a self-resetting means for automatically clearing the receiver circuit after the light-emitting diode is turned "on" so that the string of sensor information transmitted by the receiving circuit to the monitor only includes the new information desired by the user and does not include any stale information previously stored by the device.

4,523,100

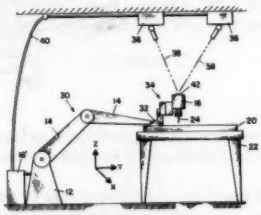
OPTICAL VERNIER POSITIONING FOR ROBOT ARM

Fred A. Payne, Marina del Rey, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Aug. 11, 1982, Ser. No. 407,164

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—561 **9 Claims**



1. In a computer controlled robot arm system having a work head on the free end thereof and being able to position and hold the work head adjacent the work piece at coordinates within the first tolerance, the improvements to position and hold the work head within second, closer, tolerance limits, comprising:

(a) means operably driven by the computer for directing a first collimated light beam through points associated with the desired coordinates;

(b) detector means carried by the work head and operably connected to the computer for detecting such light beam and sending a signal indicating the position of said light beam on said detector means to the computer, said detector means having a central position thereon where when

said light beam is passing therethrough, the work head is at the desired coordinates within the second tolerance limits;

(c) a movable support means carried by the arm adjacent the work head for contacting the work piece and supporting the work head;

(d) vernier drive means operably connected to be driven by the computer and positioned between said support means and the work head for moving the work head in the X and Y directions when the robot arm is supported by said support means;

(e) means for moving the work head toward said coordinates and for concurrently moving said support member to contact a work piece and support the work head, with said light beam positioned within the sensing limits of the detector means; and

(f) means for energizing said vernier drive means in closed loop relationship with said detector means to place the work head with said light beam passing through said central position, whereby the work head is located at the desired coordinates within said second tolerance limits.

4,523,101

IMAGE SCANNING SYSTEM WITH SIGNAL INTEGRATION TIME CONTROL

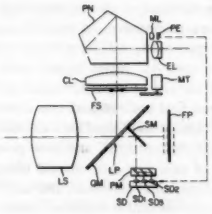
Tokuichi Tsunekawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 398,810

Claims priority, application Japan, Jul. 23, 1981, 56-115484

Int. Cl.³ G03B *3/10*; H01J *40/14*

U.S. Cl. 250—578 **23 Claims**



1. A radiation sensing system comprising:

(A) signal integration type radiation sensing means responsive to radiation and arranged to produce an electrical output indicative of the integration of the received radiation during a signal integration time;

(B) radiation measuring means arranged to measure radiation substantially equivalent to the radiation which said sensing means receives, said measuring means producing an electrical output indicative of the intensity of the received radiation; and

(C) signal integration time control means for controlling the signal integration time of said sensing means on the basis of the outputs of said measuring means and said sensing means,

wherein said signal integration time control means is arranged to determine an initial signal integration time of said sensing means on the basis of the output of said measuring means.

4,523,102

SOLID-STATE COLOR-IMAGE SENSOR AND PROCESS FOR FABRICATING THE SAME

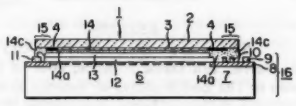
Ogawa Kazufumi; Shigeru Kondo; Yoshiko Yasuda; Taketoshi Yonezawa, all of Osaka, and Isamu Kitahiro, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 242,578, Mar. 11, 1981, Pat. No. 4,388,128. This application Jan. 31, 1983, Ser. No. 462,396

Claims priority, application Japan, Mar. 17, 1980, 55-33805; Mar. 18, 1980, 55-4857; Mar. 19, 1980, 55-35291

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—578 **10 Claims**



1. A solid-state color-image sensor comprising a color filter and a solid-state image sensor chip bonded together with an adhesive which is curable by ultraviolet-ray irradiation and by heating, said color filter having portions opaque to ultraviolet rays and other portions which transmit such rays.

4,523,103

ELECTRONIC TIME SWITCH

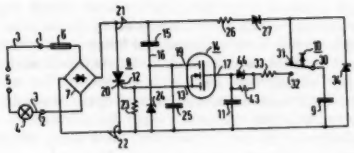
Siegmar Zirkl, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 522,036

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230571

Int. Cl.³ H01H *43/04*

U.S. Cl. 307—141 **3 Claims**



1. An electronic time switch for time-limited actuation of appliances which are supplied with alternating current, said appliances having a load component actuated by an electronic control element, and including terminals which supply the load component and the control element; a first storage element; a second storage element; and a pushbutton, the pushbutton having a first position for charging the first storage element through a rectifier in the inoperative condition, the pushbutton having a second position wherein said first storage element charges the second storage element through a recharging branch having a current limiting resistor; the improvement comprising in that said recharging branch includes:

a first line including a diode, the diode being in a conductive state when the pushbutton is in the second position and the magnitude of the voltage difference between the first and second storage elements exceeds a threshold value for conducting current from said first storage element to the electronic control element to actuate the electronic control element and to conduct current to the second storage element to charge the second storage element; and

a second line electrically connected in parallel with the first line and having a resister for conducting current to the second storage element when the pushbutton is in the second position and the voltage difference between the

first and second storage elements falls below the threshold value to continue conducting current from the first storage element to the electronic control element to maintain the electronic control element actuated, and to continue conducting current to the second storage element to further charge the second storage element;

whereby, the second storage element discharges current after the pushbutton is moved from the second position to the first position to maintain the electronic control element actuated for a pre-determined length of time after the pushbutton is moved to the first position, the predetermined length of time being determined by the length of time the pushbutton is held in the second position.

4,523,104

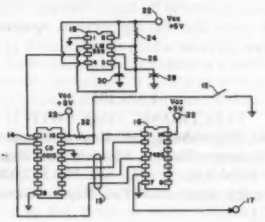
SWITCH DEBOUNCE CIRCUIT

Frank A. Norris, and David J. Krile, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 22, 1983, Ser. No. 468,629

Int. Cl.³ H03K *19/20, 17/56;* **G08C** *9/00*

U.S. Cl. 307—247 A **2 Claims**



1. A circuit for eliminating the transient electrical effects of contact bounce occuring within a switch, for use with a single pole, single throw switch having only two contact members, one of which is a movable contact lever which engages the other contact member, the switch being closed when the two contact members are engaged and being open when the two contact members are separated, the switch having a control member having first and second positions for moving the contact members to be closed and open respectively, with bouncing between open and closed for a time after changing the position of the control member, there being a single direct-current bias source having a supply lead and a ground lead, wherein said circuit comprises:

a. a clock circuit comprising of a single integrated circuit clock chip having a predetermined clock frequency, at least one terminal of the clock chip being connected to said supply lead, one terminal of the chip being connected to the ground lead, and one terminal of the clock chip being an output terminal for the clock signal, the clock circuit being operative to produce a continuous train of clock pulses at its output terminal at a frequency providing a period of approximately one millisecond per clock pulse;

b. a shift register comprising a single integrated register circuit chip, having N stages and N parallel output terminals, N being at least four, a serial input terminal, the shift register being connected to operate in a serial input mode with output to said N parallel output terminals, one terminal of the register chip being connected to said supply lead, one terminal of the register chip being connected to the ground lead, said switch having one contact member connected to the ground lead and its other contact member connected directly to said serial input terminal, a pull-up resistor connected between the supply lead and the serial input terminal, the potential supplied via the pull-up resistor being a first logic state which appears at said serial input terminal responsive to the switch being open, and ground potential being a second logic state which appears at the serial input terminal responsive to the switch being closed, one terminal of the register chip being a clock input which is connected to said output terminal of the clock chip, the shift register being operative to advance once for each clock pulse to set its first stage to the logic state at the serial input terminal and the oter stages each to the state of the preceeding stage;

c. a gate device consisting of at least part of a gate chip, which is a single integrated circuit chip, having N input terminals connected respectively to the N parallel output terminals of the register chip, one terminal of the gate chip being connected to said supply lead, one terminal of the gate chip being connected to the ground lead, the gate chip having a gate output terminal for supplying an output signal indicative of the position of the switch, the gate being a coincidence device in which the logic state at the gate output terminal depends on wheter or not all N input terminals are at the same given one of said logic states.

4,523,105

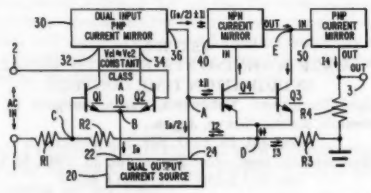
FULL WAVE RECTIFIER CIRCUIT FOR SMALL SIGNALS

David L. Jose, Hamilton Square; Winthrop S. Pike, Princeton, and Jack Craft, Bridgewater, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 27, 1982, Ser. No. 424,264

Int. Cl.³ H03K *5/08, 5/13*

U.S. Cl. 307—261 **3 Claims**



1. A full wave rectifier circuit comprising:

amplifier means responsive to an AC input signal to be rectified for providing a bidirectional output current proportional to said AC input signal, said amplifier means including an inverting input terminal and a non-inverting input terminal first and second non-complementary emitter coupled transistors biased for operation at substantially constant collector, emitter, and base potential levels, said base of one of said first and second transistors connected to said inverting input terminal, and said base of other one of said first and second transistors connected to said non-inverting input terminal;

a first resistor coupled to apply said AC input signal to said inverting input terminal of said amplifier means;

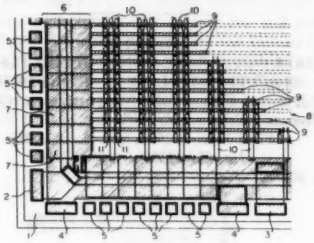
third and fourth complementary emitter-coupled base-coupled transistors having a common base connection for receiving said bidirectional output current and a common emitter connection coupled via a second resistor to said inverting input terminal and coupled via a third resistor to a point of reference potential; and

a cascade connection of first and second complementary current mirror amplifiers, the input of each being connected to the collector electrode of a respective one of said complementary transistors, the second current mirror amplifier having an output coupled to said point of reference potential via a fourth resistor for developing a full wave rectified output voltage, said first, second, third and fourth resistors being selected to provide a predetermined gain for said full wave rectifier.

4,523,106
INTEGRATED CIRCUIT HAVING PREDETERMINED OUTER TO INNER CELL PITCH RATIO

Tetsu Tanizawa; Hitoshi Omichi, both of Kawasaki, and Yoshiharu Mitono, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1982, Ser. No. 411,269
Int. Cl.³ H03K 3/26, 1/00; H01J 37/28
U.S. Cl. 307—303 8 Claims



1. An integrated circuit device formed on a semiconductor chip having sides, comprising:

an inner cell array having at least one side, formed on the semiconductor chip, including a plurality of inner cells having a pitch length P_I;

an outer cell array formed between said at least one side of said inner cell array and one of the sides of the semiconductor chip, including a plurality of outer cells having a pitch length P_E and patterns, and formed such that corresponding sets of said outer cells and said inner cells are arranged in predetermined positions a plurality of times along said one of the sides of the semiconductor chip, and wherein the pitch length of said outer cells and inner cells is related by the formula $mP_E = nP_I$, where m and n are positive integers;

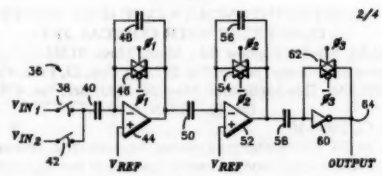
a power supply portion, formed on said outer cell array between said one of the sides of the semiconductor chip and said at least one side of said inner cell array, having one or more outer power supply lines; and

a plurality of inner power supply lines operatively connected to said outer power supply lines and formed on said inner cell array.

4,523,107
SWITCHED CAPACITOR COMPARATOR

Joe W. Peterson, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 23, 1982, Ser. No. 371,110
Int. Cl.³ G06G 7/14; H03K 5/22
U.S. Cl. 307—352 1 Claim



1. A switched capacitor comparator having an input terminal selectively coupled to a plurality of input voltages for providing an output voltage which is proportional to the difference of said input voltages, comprising:

a first operational amplifier having a noninverting input coupled to a reference voltage, an inverting input and an output;

a first coupling capacitor coupled between said input terminal and the inverting input of said first operational amplifier;

first switching means coupled between the inverting input and output of said first operational amplifier, said first switching means being conductive in response to a first control signal;

a first feedback capacitor coupled between the inverting input and output of said first operational amplifier;

a second operational amplifier having a noninverting input coupled to said reference voltage, an inverting input and an output;

a second coupling capacitor coupled between the inverting input of said second operational amplifier and the output of said first operational amplifier;

second switching means coupled between the inverting input and output of said second operational amplifier, said second switching means being conductive in response to a second control signal;

a second feedback capacitor coupled between the inverting input and output of said second operational amplifier;

an inverter having an input and an output for providing said output voltage;

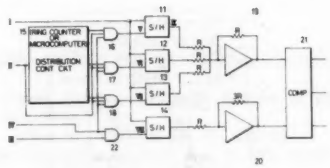
a third coupling capacitor coupled between the output of said second operational amplifier and the input of said inverter; and

third switching means coupled between the input and output of said inverter, said third switching means being conductive in response to a third control signal, and said first, second and third control signals couple and sequentially decouple an output from a predetermined input of each of the first operational amplifier, the second operational amplifier, and the inverter, respectively.

4,523,108
AVERAGING CIRCUIT

Masaaki Niiho, and Takuo Itagaki, both of Tokyo, Japan, assignors to Asahi Kogaku K.K.K., Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,532
Claims priority, application Japan, Jul. 22, 1981, 56-114599
Int. Cl.³ H03K 5/01, 5/153; G01C 3/08
U.S. Cl. 307—353 7 Claims



1. An averaging circuit for processing an input signal which is intermittent and has a period, comprising,

first through nth sample and hold circuit means for sampling and holding said input signal in response to sample pulses applied thereto, respectively,

distribution means for generating and cyclically applying sample pulses to said first through said nth sample and hold circuit means, to cause said first through said nth sample and hold circuit means to sample said input signal during n successive periods thereof, respectively,

an adder for adding the outputs of said first through nth sample and hold circuit means, wherein said distribution control circuit comprises a ring counter.

4,523,109

DIFFERENTIAL AMPLIFIER FILTER CIRCUIT HAVING EQUAL RC PRODUCTS IN THE FEEDBACK AND OUTPUT LOOPS

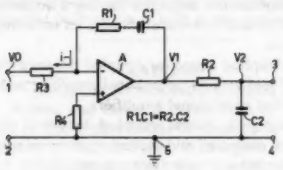
Frederik J. Van Roessel, Upper Saddle River, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1982, Ser. No. 435,425

Claims priority, application Netherlands, Nov. 20, 1981, 8105255

Int. Cl.³ H03H *11/12*

U.S. Cl. 307—520 **2 Claims**



1. A filter circuit comprising input and output terminals and a differential amplifier, said amplifier having a (−) inverting input, a (+) non-inverting input and an output, the (−) inverting input being connected to the output via a series circuit including a first capacitor and a first resistor, the output of said amplifier being coupled via a series circuit of a second resistor and a second capacitor to a terminal carrying a reference voltage, the (+) non-inverting input to the amplifier having a DC connection to said reference voltage terminal, one said input to said filter circuit being connected to said reference voltage terminal, the other input to said filter circuit being coupled to said (−) inverting input to said amplifier, the junction between the second resistor and the second capacitor being connected to said output terminal of the filter circuit, the RC time constant of the first capacitor and the first resistor is substantially equal to the RC time constant of the second capacitor and the second resistor.

4,523,110

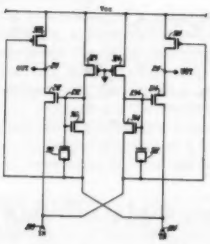
MOSFET SENSE AMPLIFIER CIRCUIT

Mark G. Johnson, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Sep. 30, 1983, Ser. No. 537,916

Int. Cl.³ H03K *5/24;* **G11C** *7/06*

U.S. Cl. 307—530 **5 Claims**



1. A sense amplifier, having a gain greater than one, for sensing the relative voltage of a pair of input signals on a pair of input terminals, comprising:

first and second amplifier transistors, each having a source terminal connected to one of said pair of input terminals and a drain terminal, that is also one of first and second output terminals, connected to a bias means for biasing said drain terminal, that is in turn connected to a supply voltage terminal;

each of which amplifier transistors has a gate terminal connected to a gate voltage means for controlling said gate terminal; characterized in that:

each of said gate terminal of said first and second amplifying transistors is connected through first and second level-shifting network means to the source terminal of the other of said first and second amplifier transistors, whereby that signal present on each of said pair of input terminals is applied to the gate of one of said amplifier transistors at a first gate voltage and to the source of the other of said amplifier transistors at a first source voltage.

4,523,111

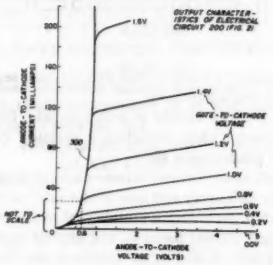
NORMALLY-OFF, GATE-CONTROLLED ELECTRICAL CIRCUIT WITH LOW ON-RESISTANCE

Bantval J. Baliga, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 7, 1983, Ser. No. 473,089

Int. Cl.³ H03K *17/60, 3/353*

U.S. Cl. 307—574 **6 Claims**



1. A normally-off, gate-controlled electrical circuit with low on-resistance, comprising:

(a) a JFET having source, drain and gate electrodes;

(b) an IGFET having source, drain and gate electrodes and being of the normally-off type;

(c) the JFET source electrode and the IGFET drain electrode being ohmically connected together and the JFET drain electrode and the IGFET source electrode being adapted to carry load current through the electrical circuit;

(d) the IGFET gate electrode constituting a circuit gate electrode for receiving control signals that determine the conductivity state of the circuit, and

(e) bias means interconnected with both the JFET and IGFET gate electrodes and responsive to control signals on the circuit gate for biasing said JFET into a bipolar conduction mode when said IGFET is in a conduction state, whereby low on-resistance of the electrical circuit is attained.

4,523,112

ELECTROTHERMODYNAMIC (ETD) POWER CONVERTER WITH CONICAL JET

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

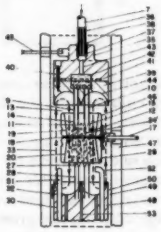
Continuation-in-part of Ser. No. 237,290, Feb. 23, 1981, Pat. No. 4,395,648. This application May 29, 1983, Ser. No. 479,986

Int. Cl.³ H02N *1/00*

U.S. Cl. 310—10 **8 Claims**

1. In an Electrothermodynamic heat/electric power converter, a converter body, a carrier gas-vapor having a subsonic velocity under pressure in said converter body, a source of superheated vapor, a micro orifice nozzle, the throat of said micro orifice nozzle having a diameter D_o, said superheated vapor being supplied to said micro orifice nozzle, a jet of supercooled vapor issuing from said micro orifice nozzle, an ion source comprising an emitter point, a charging electrode in proximity to said emitter point, a collector point electrode, an

electrical load connected between said emitter and said collector, said jet issuing from said nozzle at a supersonic velocity, thereby forming an expanding jet having a conical boundary between said expanding jet and said gas-vapor, the apex of said conical boundary being a distance a_o to the said throat diameter D_o of said micro orifice nozzle, said boundary making a half apex angle θ to the axis of said jet, said angle θ being between 10° to 50° as a function of the Mach Number of the jet $1.4<M<2.4$ ions from said ion source being emitted within an ion cone into the supercooled vapor of said jet, said ion cone having a half apex angle α, a charged aerosol formed by condensation of the said supercooled vapor in said jet onto said ions at the entrance plane $z=a$, the kinetic power density of the said supersonic jet being thereby decreased from $z=a_o$ to $z=a$ by a factor of $10^4>(a/a_o)^2>10^2$, said charged aerosol being



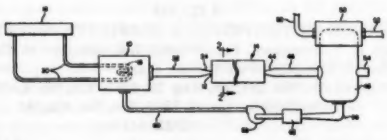
established within said conical boundary layer between said entrance plane at $z-a$ and an exit plant at $z=b$, said distances a and b being measured from said apex, ions of a sign opposite to that of said charged aerosol, said charged aerosols being discharged at the plane $z-b$ by said ions of opposite sign emitted from said collector point, said charged aerosol having a charged density which decreases according to $(z/a)^m$ from $z=a$ to $z=b$, where m is a negative exponential number $-2<m<0$, the power conversion in said cone between $z=a$ and $z=b$ being increased by the factor $40>\Gamma>1$; whereby a substantial proportion of the heat kinetic power of said supersonic jet is directly converted to electrical power within said jet, at increased current, decreased voltage and increased conversion space length $L=b-a$, compared to constant charge density conversion, for which $m=0$.

4,523,113

MAGNETOHYDRODYNAMIC GENERATOR SYSTEM

William R. Kallman, Portland, Oreg., assignor to Martin Reid Johnson, Austin, Tex., a part interest

Filed Apr. 25, 1983, Ser. No. 488,256
Int. Cl.³ H02K *45/00*
U.S. Cl. 310—11 **8 Claims**



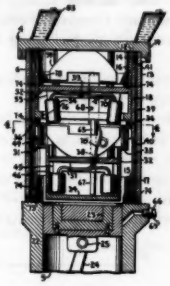
1. A method of generating electricity which comprises:
preparing a solution of liquid ammonia and an element which dissolves and ionizes in such liquid ammonia to produce cations of the element and electrons which are solvated by the ammonia, and
moving said solution containing such solvated electrons through a magnetohydrodynamic generator.

4,523,114

MAGNETIC RECIPROCATING MOTOR

Raymond H. Smith, Rte. 2 - 5AAA, Larned, Kans. 67550

Continuation of Ser. No. 523,337, Aug. 15, 1983, abandoned. This application Mar. 9, 1984, Ser. No. 587,820
Int. Cl.³ H02K *33/00*
U.S. Cl. 310—24 **11 Claims**



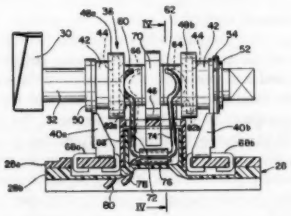
1. A magnetic reciprocating motor, which comprises:
(a) a block;
(b) a crankshaft journalled in said block;
(c) a cylinder mounted on said block and including inboard and outboard portions;
(d) a cylinder head mounted on said cylinder outboard portion;
(e) a piston slidably disposed in said cylinder inboard portion and including a piston magnet;
(f) a carrier assembly slidably disposed in said cylinder outboard portion and including inboard and outboard sliding elements slidably reciprocable with respect to each other;
(g) a first permanent magnet on said piston;
(h) a first electromagnet mounted on said carrier assembly inboard sliding element;
(i) a second permanent magnet mounted on said carrier assembly inboard sliding element;
(j) a second electromagnet mounted on said carrier assembly outboard sliding element;
(k) a third permanent magnet mounted on said head; and
(l) means for energizing said electromagnets whereby said magnets repulse each other and said piston and said carrier assembly are reciprocated within said cylinder.

4,523,115

SWITCHING DEVICE FOR REVERSING A PORTABLE ELECTRIC TOOL

Giuseppe Cuneo, Calolziocorte, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Jun. 19, 1984, Ser. No. 622,113
Claims priority, application Italy, Jun. 21, 1983, 22175/83[U]
Int. Cl.³ H02K *7/14;* H01H *9/06*
U.S. Cl. 310—50 **17 Claims**



1. A portable electric tool, comprising:

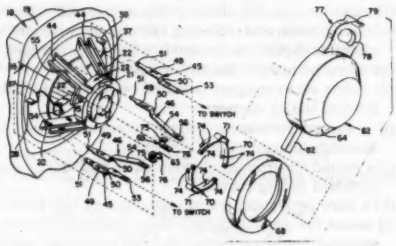
an electric motor having two directions of rotation;
a switching device for reversing the direction of the current through the motor to reverse the direction of rotation thereof;
a circuit board electrically connected to said motor;
said switching device comprising two pairs of contacts which extend in caltilever fashion from said circuit board, a rotatable shaft having axially spaced apart terminals thereon, and said terminals being electrically insulated from said contacts by insulating collars secured to said shaft;
each of said collars having a window therein for access to the respective terminal; and
said contacts being resiliently biased against said collars with one of each pair of contacts engaging a respective terminal through the respective window in one direction of rotation of the motor, and the other of each pair of contacts engaging the opposite respective terminal through the respective window in the opposite direction of rotation of the motor.

4,523,116

ELECTRICAL CONNECTION SYSTEM FOR MOTORS

John E. Dibbern, Jr., Street, and Gregory E. Moores, Reisterstown, both of Md., assignors to Black & Decker, Inc., Newark, Del.

Filed Mar. 31, 1983, Ser. No. 480,781
Int. Cl.³ B23B *45/2*; H02K *15/14*
U.S. Cl. 310—71 **24 Claims**



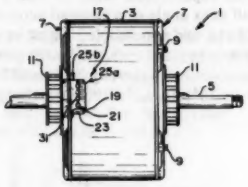
1. In an electric motor having a housing, the housing including a rear portion, an armature rotatably mounted in the housing, a commutator operatively associated with the armature, a pair of brushes engaging the commutator, a field mounted in the housing, the field having a plurality of terminals thereon, the improvement comprising: the housing further including a main portion receiving the field, the rear portion of the housing including a bearing boss and at least two discrete bridge members joining the bearing boss to the main portion of the housing, the bridge members having respective openings formed therein adjacent to the main portion of the housing, at least one of the bridge members further having an exterior surface and an open channel formed in said exterior surface, first and second contact elements mounted on the rear portion of the housing, each of the contact elements having respective forward and rearward end portions, the respective forward end portions of the contact elements being received through the respective openings in the bridge members, the forward end portions of the contact elements further being connected to respective terminals on the field, first means for connecting the rearward end portion of one of said contact elements to one of the brushes, second means for connecting the rearward end portion of the other of said contact elements to a source of electrical energy, and one of said contact elements being supported in said channel.

4,523,117

DYNAMOELECTRIC MACHINE WITH SELF-SEALING LEAD WIRE GROMMET

Nicholas R. Daniels, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 16, 1978, Ser. No. 916,076
Int. Cl.³ H02K *5/10*; H02G *3/18*; H01B *17/30*
U.S. Cl. 310—71 **2 Claims**



1. In a dynamoelectric machine comprising a shell and at least one end shield engaged with the shell at one end thereof, a plurality of lead wires, said shell having an open ended slot at said one end thereof constituting a pass-through opening in the shell through which said lead wires for the motor are routed, wherein the improvement comprises: a lead wire pass-through grommet sealably engaging said lead wires and sealably closing said pass-through opening, said grommet comprising a pair of identical grommet members each having an inner end and an outer end, each of said grommet members having a plurality of lead wire receiving notches in its inner end and grooves in its sides and in the outer end thereof for reception of portions of said shell defining the sides and end of said slot, one of said grommet members being installed in said slot with the grooves in its sides and outer end receiving portions of said shell adjacent said slot and with its inner end facing outwardly of said slot, the other of said grommet members being installed in said slot with its inner end facing in toward the inner end of the previously installed grommet member and with the grooves in its sides receiving portions of said shell adjacent said slot, said pair of grommet members being so sized in relation to said slot so as to substantially close the slot, said grommet members being further to sized that the outer end of said other grommet member is engaged solely by said end shield, the inner ends of both of said grommet members being forced into sealing engagement with one another by said end shield, and the sides of both grommet members and the outer end of said one grommet member being forced into sealing engagement with the shell by said end shield, said lead wires being received in said notches and the portions of the inner ends of the grommet members defining said lead wire receiving notches being so structured so as to be forced into clamping, sealing engagement with said lead wires received therein along a line of contact thereby to seal the lead wires with respect to the grommet members and to provide strain relief for the said lead wires.

4,523,118

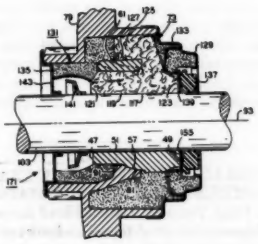
METHOD OF PROVIDING A LUBRICATION SYSTEM

Eldon R. Cunningham, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 294,748, Aug. 20, 1981, Pat. No. 4,409,714.
This application Apr. 4, 1983, Ser. No. 481,951
Int. Cl.³ H02K *5/16*
U.S. Cl. 310—90 **3 Claims**

1. A method of providing a lubrication system for a shaft of a dynamoelectric machine to assure adequate shaft lubrication particularly during a run-in operation of the dynamoelectric machine when it is first energized, and the lubrication and bearing system including means for rotatably journaling the shaft, a reservoir, a feeder wick member, and a storage wick material containing a lubricating oil, the method comprising the steps of:

impregnating the feeder wick member with a solid lubricant;
assembling the impregnated feeder wick member with the journaling means in wiping engagement with the shaft and communicating at least a part of the impregnated feeder wick member with the reservoir of the lubrication system;
placing the storage wick material containing the lubricating oil in the reservoir in communication with the at least a part of the impregnated feeder wick member;
lubricating the shaft only with the solid lubricant of the impregnated feeder wick member in its wiping engagement with the shaft during at least a part of the initial run-in operation of the dynamoelectric machine when it is energized for the first time;
effecting a flow of the lubricating oil from the storage wick material through the impregnated feeder wicking member



in the wiping engagement with the shaft into lubricating communication therewith in response to the rotation of the shaft within the journaling means when the dynamoelectric machine is energized;
releasing at least some of the solid lubricant bit-by-bit from the impregnated feeder wick member into the lubricating oil upon the flow thereof through the impregnated feeder wicking member so as to form a lubricating mixture of the solid lubricant with the lubricating oil;
circulating the lubricating mixture through the lubrication system to at least in part effect further release of the solid lubricant material into the lubricating mixture; and
continuing the lubrication of the shaft in the journaling means with the lubricating mixture upon further energization of the dynamoelectric machine subsequent to the initial run-in operation thereof.

4,523,119

APPLICATION OF LITHIUM TETRABORATE TO SAW DEVICES

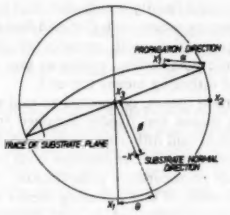
Roger W. Whatmore, Bletchley, and Iain M. Young, Malvern, both of England, assignors to Plessey Overseas Limited, Ilford, England

Continuation of Ser. No. 271,112, Jun. 8, 1981, abandoned. This application Jun. 29, 1984, Ser. No. 625,590

Claims priority, application United Kingdom, Jun. 11, 1980, 8019062; Dec. 23, 1980, 8041183

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—313 A **1 Claim**



1. A piezoelectric device which is a surface acoustic wave device in which the active material is lithium tetraborate on X cut Z propogating or an orientation close to X cut or Z propagating.

4,523,120

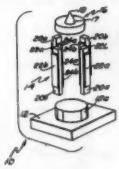
PRECISE BEARING SUPPORT DITHERER WITH PIEZOELECTRIC DRIVE MEANS

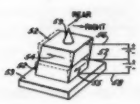
Gerald L. Assard, Waterford, and Arthur L. Moorcroft, Norwich, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1984, Ser. No. 617,049

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—323 **4 Claims**





1. An apparatus for dithering a jewel bearing supporting a precision instrument readout indicator, comprising:
a rigid, non-magnetic support base having a vertical axis and horizontal x and y axes;
piezoceramic dithering means, extending vertically upward from said support base, the bottom end thereof being fixedly attached to said support base while the top end

thereof is free to move, for controllably moving said dithering means top end in preselected x and y directions;

a first function generating means, connected to said dithering means, for selectively providing a first variable electrical potential to said dithering means thereby controllably producing said x direction motion;

a second function generating means, connected to said dithering means, for selectively providing a second variable electrical potential to said dithering means thereby controllably producing said y direction motion, said x motion in conjunction with said y motion thereby producing combined x-y planar motion;

first electrode means, connected to said first function generating means and fixedly attached to first preselected areas of said dithering means such that said first electrical potential, in conjunction with preselected dithering means piezoceramic polarization, produces said x direction motion of said dithering means top end;

second electrode means, connected to said second function generating means and fixedly attached to second preselected areas of said dithering means such that said second electrical potential, in conjunction with preselected dithering means piezoceramic polarization, produces said y direction motion of said dithering means top end; and

a bearing support, attached to said dithering means, for supporting said jewel bearing, whereby said jewel bearing moves in direct proportion to said combined x-y motion of said dithering means thereby producing dynamic friction between said jewel bearing and said indicator such that, by averaging readouts therefrom, greater accuracy is achieved.

4,523,121

MULTILAYER ELECTROSTRICTIVE ELEMENT WHICH WITHSTANDS REPEATED APPLICATION OF PULSES

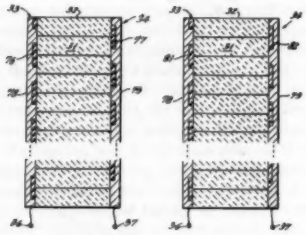
Sadayuki Takahashi; Masatomo Yonezawa; Atsushi Ochi; Takeshi Yano; Takeshige Hamatsuki, and Izumu Fukui, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,583

Claims priority, application Japan, May 11, 1982, 57-79034; May 11, 1982, 57-79035; May 11, 1982, 57-79036; May 11, 1982, 57-79037; May 11, 1982, 57-79038; May 11, 1982, 57-79039; May 12, 1982, 57-78444; May 12, 1982, 57-78445; May 12, 1982, 57-78446; May 12, 1982, 57-78447; May 12, 1982, 57-78448; May 12, 1982, 57-78449

Int. Cl.³ H01L *41/18*

U.S. Cl. 310—334 **4 Claims**



1. A multilayer electrostrictive element for dimensionally changing in a first direction in response to electrical pulses and for withstanding repeated application of said pulses, said element comprising:

a stack formed by a plurality of electrostrictive sections of an electrostrictive material and a plurality of internal electrodes sandwiched between said electrostrictive sections, said stack having a peripheral surface defining a cross-sectional area of said stack, each of said internal electrodes having peripheral ends on said peripheral surface and each of said internal electrodes having an internal electrode area which is substantially equal to a cross-sectional area of said stack;

first means for electrically connecting alternate ones of said internal electrodes together without connecting others of said internal electrodes, said first means including first insulating layer portions on a first area of said peripheral surface for covering respective peripheral ends of said others of said internal electrodes while leaving portions of said first area uncovered, each said first insulating layer portion covering the peripheral end of a respective internal electrode while extending in said first direction substantially less than the entire distance between said respective first electrode and either adjacent first electrode to leave uncovered substantial portions of the surfaces of said electrostrictive sections in said first area of said peripheral surface, and a first conductive layer continuously formed on both said first insulating layer portions and on said uncovered portions of said first area; and

second means for electrically connecting said others of said internal electrodes together, said second means including second insulating layer portions on a second area of said peripheral surface for covering respective peripheral ends of said alternate ones of said internal electrodes while leaving portions of said second area uncovered, and a second conductive layer continuously formed on both said second insulating layer portions and on said uncovered portions of said second area.

4,523,122

PIEZOELECTRIC ULTRASONIC TRANSDUCERS HAVING ACOUSTIC IMPEDANCE-MATCHING LAYERS

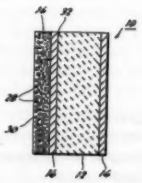
Masayuki Tone; Tsutomu Yano, both of Kawasaki, and Koetsu Saito, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 16, 1984, Ser. No. 590,465

Claims priority, application Japan, Mar. 17, 1983, 58-44946; Mar. 17, 1983, 58-44947; Nov. 4, 1983, 58-207909

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—334 **26 Claims**

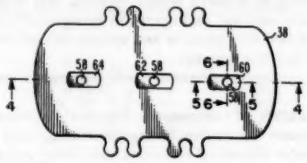


5. An ultrasonic transducer comprising an ultrasonic transducer element, a pair of electrodes provided on opposite sides of said ultrasonic transducer element, and an acoustic impedance-matching layer formed on an ultrasonic wave radiation surface of said ultrasonic transducer element through one electrode, said acoustic impedance-matching layer being made of a composite material of thermally expanded resin microballoons dispersed in a synthetic resin matrix, having a thickness of approximately a quarter wavelength or odd harmonics at the frequency generated from said transducer element and having an acoustic impedance not larger than 0.6×10^6 Ns/m^3.

4,523,123
CATHODE-RAY TUBE HAVING ASYMMETRIC SLOTS FORMED IN A SCREEN GRID ELECTRODE OF AN INLINE ELECTRON GUN

Hsing-Yao Chen, Landisville, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 6, 1983, Ser. No. 492,044
Int. Cl.³ H01J *29/51, 29/56*
U.S. Cl. 313—412 **8 Claims**



1. In a cathode-ray tube comprising an image screen and an in-line electron gun for projecting three electron beams onto said screen, said gun comprising:

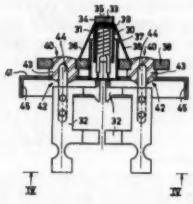
three cathodes for generating said electron beams,

a control grid, a screen grid, and a main electron lens arranged successively in alignment with said cathodes for focusing said electron beams, said control grid and said main electron lens having three apertures disposed in a plane for passing said electron beams, said screen grid having a given thickness with three transverse slots formed therein facing said main electron lens, said slots having a depth less than the thickness of said screen grid, said screen grid having an aperture within each of said slots, the improvement wherein the outer slots are asymmetric with respect to the aperture therein, each of said outer slots being displaced transversely toward said center aperture.

4,523,124
CATHODE-RAY TUBE HAVING MULTIPLATE CATHODE UNIT

Jacob Blanken, and Paul J. Van Rijswijck, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,456
Claims priority, application Netherlands, Aug. 14, 1981, 8103814
Int. Cl.³ H01J *29/48*
U.S. Cl. 313—446 **7 Claims**



1. In a cathode-ray tube comprising an envelope containing a target and an electron gun for directing an electron beam at said target, said electron gun including a cathode unit comprising:

(a) an assembly plate extending perpendicularly to a longitudinal axis of the electron gun and having a central aperture and first and second outer apertures;

(b) a cup-shaped element coaxially-disposed around said axis and extending through said central aperture, said element having an emissive body disposed on an end face thereof and having a filament disposed therein;

(c) a plurality of suspension members extending from the cup-shaped element to the assembly plate for positioning said element with its end face parallel to and at a predetermined distance from a reference surface of said assembly plate;

(d) a supporting plate extending parallel to the assembly plate and having a central aperture for providing access to the filament and having first and second outer apertures adjacent the corresponding apertures in the assembly plate;

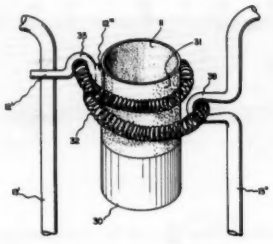
(e) first and second connection lugs electrically-connected to the filament of the cathode unit and attached to respective first and second supporting pins extending through the first and second openings in the supporting plate and into the first and second openings of the assembly plate; and

(f) first and second plugs of insulation material surrounding the first and second supporting pins and engaging edges of the assembly plate and the supporting plate defining their respective first and second apertures, to attach the supporting plate and the connection lugs in predetermined positions with respect to the assembly plate.

4,523,125
FLUORESCENT LAMP ELECTRODES

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 282,883, Jul. 13, 1981, abandoned, which is a continuation of Ser. No. 972,497, Feb. 9, 1979, abandoned. This application Jan. 3, 1984, Ser. No. 567,464
Int. Cl.³ H01J *61/067*
U.S. Cl. 313—491 **2 Claims**



1. A fluorescent lamp employing a low discharge gas pressure, said lamp comprising:

an evacuable, light-transmissive envelope having opposed ends and coated interiorly with phosphor;

a gaseous discharge medium disposed within said envelope; and

electrode means disposed at opposed ends of said envelope, said electrode means including at least one directly heated hollow cathode, coated interiorly with an emissive mixture and disposed between at least two spaced electrode supply wires for supplying electrical energy to heat said cathode, said hollow cathode comprising a metal cylinder with a filamentary coil for heating said cylinder, said coil being connected to said supply wires and disposed about the circumference of said cylinder, said coil being electrically insulated from said cylinder.

4,523,126

SHAPED DISCHARGE LAMP WITH STARTING AID

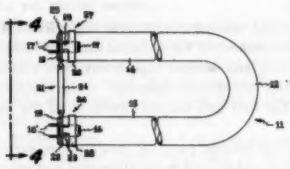
Edward E. Hammer, Mayfield Village, and Charles E. Beck, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,498

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.³ H01J *17/00, 61/00*

U.S. Cl. 313—594 **7 Claims**



1. A discharge lamp comprising an elongated bulb shaped so that its ends are substantially closer together than if the bulb where straight and containing electrodes respectively near said ends thereof, and a starting aid comprising conductive means disposed respectively adjacent to respective ends of said bulb and completely behind the plane of said electrodes with respect to the discharge path, and spatially extending means electrically interconnecting said conductive means.

4,523,127

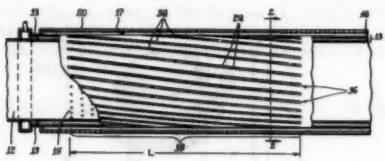
CYCLOTRON RESONANCE MASER AMPLIFIER AND WAVEGUIDE WINDOW

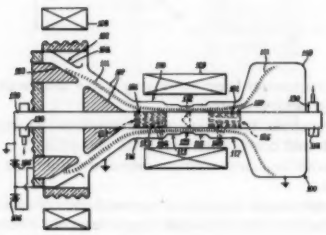
Charles P. Moeller, Del Mar, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 463,144, Feb. 2, 1983, abandoned. This application Jul. 27, 1983, Ser. No. 517,570

Int. Cl.³ H01J *25/00*

U.S. Cl. 315—4 **35 Claims**





1. Coupling apparatus for transferring microwave power between a given mode in a first waveguide and a given mode in a second waveguide, said coupling apparatus comprising first and second coaxial hollow metallic circularly cylindrical members, said first member forming a first waveguide section for coupling to said first waveguide, said first and second members forming a second waveguide section surrounding said first waveguide section and coaxial therewith for coupling to said second waveguide, said first waveguide section being bounded externally by said first member, and said second section being bounded internally by said first member and externally by said second member, said first and second members having respective radii at which a given mode in said first waveguide section propagates at substantially the same velocity as a given mode in said second waveguide section, and said first member having a plurality of apertures therethrough for transferring microwave power between said first and second waveguide sections, said apertures being small relative to the radius of said first member and spaced around the circumference of said first member.

18. A cyclotron resonance maser microwave amplifier comprising:

an assembly of components disposed successively along a common axis and including successively and coaxially an annular source of electrons, circularly cylindrical walls forming an input waveguide section, circularly cylindrical walls forming a first interaction waveguide section, circularly cylindrical walls forming a drift tube section, circularly cylindrical walls forming a second interaction waveguide section, circularly cylindrical walls forming an output waveguide section, and an annular collector of electrons;

means for forming electrons from said source into an annular beam of electrons having substantial transverse energy and directing said beam of electrons successively through said input waveguide section, said first interaction waveguide section, said drift tube section, said second interaction section and said output waveguide section to said collector, said means including magnetic means for producing magnetic lines of flux extending substantially parallel to said axis at least through said first and second interaction sections and said drift tube section;

an input waveguide extending coaxially through said annular source of electrons for introducing input microwave energy into said amplifier;

first coupling means for transferring input microwave energy from said input waveguide into said annular beam of electrons in said input waveguide section, said input waveguide providing means for transmitting microwave energy to said first interaction waveguide section, said first interaction section and said magnetic means providing means for causing said microwave energy and said electrons in said beam to interact to initiate phase bunching of said electrons, said drift tube section providing means for substantially decoupling said first interaction section from said second interaction section in respect to microwave energy while passing said bunching electrons to said second interaction section, and said second interaction section and said magnetic means providing means for causing the bunched electrons to radiate microwave energy and transfer the radiated energy to said output waveguide section, said walls forming at least one of said first and second interaction sections and said drift tube section including means for dissipating axial wall currents therein;

an output waveguide extending coaxially through said annular collector for transmitting the microwave output from said amplifier; and

second coupling means for transferring output microwave energy from said output waveguide section to said output waveguide.

4,523,128

REMOTE CONTROL OF DIMMABLE ELECTRONIC GAS DISCHARGE LAMP BALLASTS

Thomas A. Stamm, Chicago, Ill., and Zoltan Zansky, Roseville, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 10, 1982, Ser. No. 448,538

Int. Cl.³ G05B *1/00;* **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—291 **29 Claims**

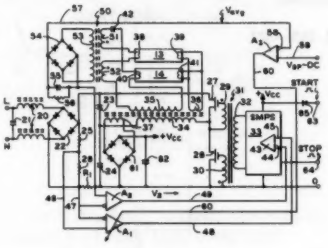
1. A remotely controlled dimming solid state ballast system

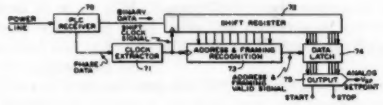
for gas discharge lamps adapted to respond to external wireless control signals comprising:

solid state dimming ballast for powering one or more of said lamps, said solid state dimming ballast including control interface means for interfacing with an external wireless control system;

control means for controlling said ballast means said control means further comprising,

signal receiving means including decoding means for receiving and decoding remotely transmitted control signals,





signal recognition means connected to said decoding means for recognizing control signals addressed to said ballast,

enabling means associated with said signal recognition means for allowing transmission of recognized control signals to an output means, and

output means for generating a setpoint output control signal modulated in response to said recognized control signals and indicative of the desired control setpoint of said one or more lamps controlled by said ballast, wherein said output means is connected between said enabling means and said ballast.

4,523,129

MODULAR LIGHTING CONTROL WITH CIRCULATING INDUCTOR

Ira J. Pitel, Morristown, N.J., assignor to Cornell Dubilier Electronics, Wayne, N.J.

Continuation of Ser. No. 286,770, Jul. 27, 1981, Pat. No. 4,464,610. This application Apr. 3, 1984, Ser. No. 580,121

The portion of the term of this patent subsequent to Aug. 9, 2001, has been disclaimed.

Int. Cl.³ H05B *41/392*

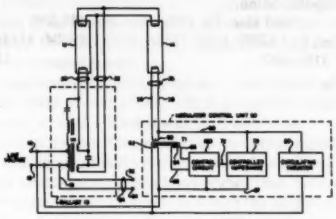
U.S. Cl. 315—291 **8 Claims**

1. In a lighting installation of the type incorporating a magnetic ballast driven by a source of a power signal and having an output for providing power to at least one gas discharge lamp, a method for controlling the illumination of said at least one lamp comprising the steps of:

supplying a constant cathode heating power to the gas discharge lamp;

providing a controlled impedance at the output side of said ballast and in series with said at least one lamp, said controlled impedance having predefined conductive and non-conductive states;

during each cycle of said power signal, controlling the length of time which said controlled impedance remains in its conductive state in relationship to the desired illumination of said lamp; and



providing a current conduction path during the length of time which said controlled impedance is in a non-conductive state by interposing an inductor between said source of power signal and said at least one gas discharge lamp.

4,523,130

FOUR LAMP MODULAR LIGHTING CONTROL

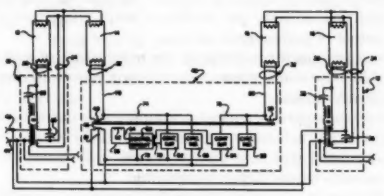
Ira J. Pitel, Morristown, N.J., assignor to Cornell Dubilier Electronics Inc., Wayne, N.J.

Continuation of Ser. No. 309,260, Oct. 7, 1981, Pat. No. 4,463,287. This application Mar. 28, 1984, Ser. No. 580,173

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.³ H05B *41/392*

U.S. Cl. 315—291 **8 Claims**



1. In a lighting installation of the type incorporating multiple magnetic ballasts driven by a source of power signal, each said ballast having an output for providing power to at least one gas discharge lamp, a method for controlling the illumination of said lamps comprising the steps of:

supplying a constant cathode heating power to the gas discharge lamps;

providing a controlled impedance at the output side of each said ballast and in series with each said lamp, each said controlled impedance having predefined conductive and non-conductive states;

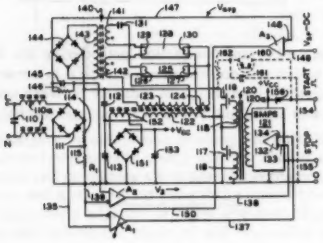
during each cycle of said power signal, controlling the length of time which each said controlled impedance remains in its conductive state in relationship to the desired illumination of said lamps; and

providing a current conduction path during the length of time which each said controlled impedance is in a non-conductive state by interposing an inductor between said source of power signal and said gas discharge lamps.

4,523,131
DIMMABLE ELECTRONIC GAS DISCHARGE LAMP BALLAST

Zoltan Zansky, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 10, 1982, Ser. No. 448,539
Int. Cl.[3] G05F *1/00*; H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—307 13 Claims



1. A two-wire electronic dimming ballast arrangement for one or more gas discharge lamps comprising:

a source of variable pulse width square wave electric power;

a source of full-wave rectified AC;

single inverter means adapted to be driven by said variable pulse width electric power;

first transformer means for supplying electric power of substantially constant voltage to the heating filaments of said one or more gas discharge lamps connected to the output of said inverter means;

control means for modulating the pulse width of said variable pulse width square wave electric power driving said inverter means;

distortion suppression means for suppressing current abberations and achieving substantially a unity power factor associated with said control means, said distortion suppression means further comprising:

first signal generating means for generating a continuous signal indicative of the instantaneous value of the voltage of said full-wave rectified AC,

second signal generating means for generating a continuous signal indicative of the instantaneous value of the current of said full-wave rectified AC,

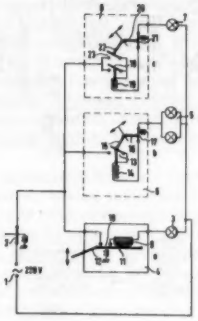
comparator means in said control means having first and second inputs connected to the outputs of said first and second signal generating means, respectively, said comparator means generating an error signal output therefrom indicative of any phase or shape difference between said rectified voltage and said rectified current and wherein any error signal output from said comparator induces said control means to modulate the pulse width of said variable pulse width electric power driving said inverter in a manner such that the drawn current changes shape to match said voltage; and

dimming means associated with said first signal generating means for modulating the output of said one or more gas discharge lamps by modulating the output of said first signal generating means.

4,523,132
CENTRALLY CONTROLLED LIGHTING INSTALLATION HAVING A PLURALITY OF INDIVIDUALLY SWITCHED LIGHT POINTS CENTRAL SWITCH ELEMENTS AND INDIVIDUAL LIGHT SWITCHES THEREFOR

Dieter Christiansen, Leipziger Strasse 47, Mettmann, Fed. Rep. of Germany (D-4020), and Bernd Redies, Im Rottfeld 17, Düsseldorf, Fed. Rep. of Germany (D-4000)

Continuation of Ser. No. 261,386, May 7, 1981, abandoned. This application May 30, 1984, Ser. No. 615,710
Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018948
Int. Cl.[3] H05B *37/00*
U.S. Cl. 315—321 10 Claims



1. In an electric power system for a house or the like, where there are a plurality of individual light sources at various locations and there is a two-wire cabling for power delivery, a system which provides for individual operation of said light sources at their related locations for both activation and deactivation of related light sources, and also for deactivation of said light sources from a master location without interference with subsequent individual activation and deactivation of said light sources, said system comprising;

(a) a plurality of individual switch assemblies, each of which is operatively connected to at least a related one of said light sources for individual operation thereof, each individual switch assembly comprising:

(1) a first on-off switch kept in its closed position by a magnet coil where power is delivered to said light source and kept in its open position where power is not delivered to said light source,

(2) means to operate said first on-off switch independent from the force effected by the magnet coil to close it, to selectively

(aa) close and open said first on-off switch mechanically from outside the individual switch assembly and

(bb) close said first on-off switch mechanically from outside the individual switch assembly and to open said first on-off switch electrically by means of a second normally kept closed on-off switch between said magnet coil and one of the power outlets of said individual switch assembly and

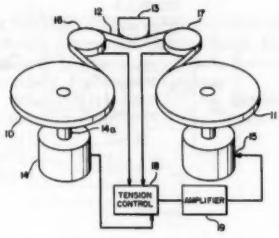
(cc) open said first on-off switch electrically by said second on-off switch and to close said first on-off switch electrically by third normally kept open on-off switch arranged parallel to said first on-off switch, and

(b) master switch means which is normally kept in its closed switch position and which may be opened for momentary power interruption of the electrical power system, resulting in an opening of said first on-off switch of each individual switch assembly.

4,523,133
TAPE TRANSPORT SYSTEM WITH TENSION SENSING BEARINGS

Carl Messenger, Philadelphia, Pa., assignor to Computer Peripherals Inc., Minneapolis, Minn.

Filed Jan. 13, 1982, Ser. No. 339,140
Int. Cl.³ B65H *59/38;* G11B *15/43*
U.S. Cl. 318—7 **16 Claims**



1. A system for transporting magnetic tape between reels and past a magnetic read/write head, comprising

a pair of tape-deflecting bearings, respectively supporting the tape on opposite sides of said head,

said bearings being geometrically positioned relative to the head so as to produce a predetermined amount of tape wrap about the head, with one direction of curvature around said bearings and the opposite direction of curvature around said head,

said pair of bearings being the only tape-deflecting bearings between the reels and the head, and said bearings being constructed and arranged so as not to be subject to intentional displacement in the plane of rotation of the tape reels,

each of said bearings having means for sensing the tension in the tape portion supported thereby,

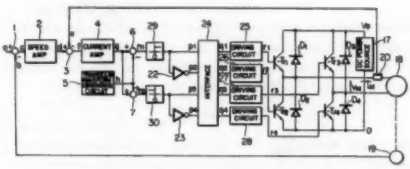
servo motors for driving said reels, and

means for utilizing the tension sensed by both said sensing means to control the motor driving one of said reels.

4,523,134
CONTROL SYSTEM FOR DC MOTORS

Hisashi Kinoshita, Katano; Hideki Yoshitake, Toyonaka, and Nin Kake, Takarazuka, all of Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Filed May 8, 1984, Ser. No. 608,249
Int. Cl.³ H02P *5/00*
U.S. Cl. 318—313 **6 Claims**



1. A DC motor control system comprising:

a DC motor;

a bridge circuit which is constituted by first, second, third and fourth switching elements and which is fed by a DC power source and has said DC motor connected thereto as an electric load thereon;

a speed sensor for sensing a rotational speed of said DC motor;

a current sensor for sensing an electric current flowing through said DC motor;

a triangular waveform generator for generating a triangular waveform signal;

an adder for adding the triangular waveform signal to a control signal obtained on the basis of an externally applied speed command signal and negative feedback signals supplied from said speed sensor and said current sensor;

a subtractor for subtracting the triangular waveform signal from the control signal;

a first comparator for generating an output signal when an output signal of said adder, which is applied to said first comparator, is at a level lower than zero volt;

a second comparator for generating an output signal when an output signal of said subtractor, which is applied to said second comparator, is at a level higher than zero volt;

first and second driving circuits to which the output signal of said first comparator and an inverted signal thereof are applied respectively through an interface circuit; and

third and fourth driving circuits to which the output signal of said second comparator and an inverted signal thereof are applied respectively through said interface circuit,

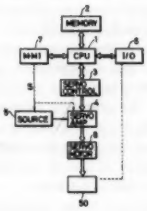
said first and second driving circuits and said third and fourth driving circuits being provided with respective output signal interlocking circuits,

whereby said third and fourth switching elements connected in series across said DC power source are driven by said first and second driving circuits, respectively, and said first and second switching elements connected in series across said DC power source are driven by said third and fourth driving circuits, respectively.

4,523,135
SAFETY MAINTAINING APPARATUS FOR AUTOMATIC MACHINES

Takashi Kogawa, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,791
Claims priority, application Japan, Nov. 2, 1982, 57-191866
Int. Cl.³ G05B *9/02*
U.S. Cl. 318—565 **18 Claims**



1. In an automatic machine having a movable part driven by a servo-control system and which operates in a plurality of different modes, a safety maintaining apparatus for an automatic machine, characterized by:

means for generating a mode signal indicative of a specified one of a plurality of control modes; and

means for limiting a velocity of a servomotor in response to reception of the mode signal, the limiting means being arranged in a loop of a servo-amplifier which feeds driving energy to said servomotor for driving said movable part.

4,523,136

SAFETY ARRANGEMENT FOR AN ADJUSTMENT INSTALLATION OF A SEAT ADJUSTABLE MANUALLY OR PROGRAMMED

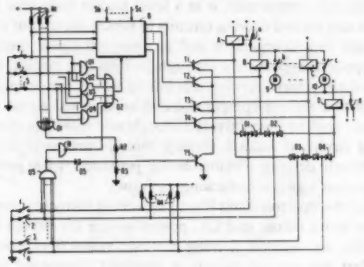
Ingo Dudeck, Weinstadt; Ulrich Hipp, Wernau/Neckar; Manfred Maass, Esslingen, and Harald Ruoff, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 601,004

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313633

Int. Cl.³ G05B *19/42*

U.S. Cl. 318—568 11 Claims



1. A safety arrangement for an adjusting installation of a seat actuatable manually by manual adjusting buttons or programmed by way of position buttons, comprising one adjusting motor for each adjusting plane selectively controllable by way of contact means, of relay means, and a control logic circuit means including position memory means for storing certain seat positions by way of a memory button, characterized in that each adjusting motor is connected in a series circuit with relay contact means coordinated thereto, that all series circuits are connected in parallel and in that the parallel circuit is connected at its two interconnections in series with a changeover relay contact means which is connected in the normal position with one terminal and in the operating position with the other terminal of an energy source,

in that the relay means include energizing windings connected on one side directly with one terminal of the energy source and on the other side with the other terminal of the energy source, on the one hand, by way of a matrix means and the manual adjusting buttons and, on the other hand, by way of a series circuit including one transistor circuit means each controlled by the coordinated position button by way of the memory means and the control logic circuit means and coordinated to a corresponding relay means and of a transistor circuit means common to all relay means, the common transistor circuit means being conductive during actuation of a position button and being nonconductive with non-actuated buttons as well as with actuated manual adjusting buttons by themselves or together with position buttons,

in that a programmed seat adjustment is interrupted if in addition to the position button coordinated to the seat adjustment a further position button or a manual adjusting button is actuated causing energization of the relay means coordinated to the actuated manual adjusting button,

in that a manual seat adjustment is interrupted as long as the two manual adjusting buttons coordinated to the forward as also to the rearward movement of one and the same adjusting motor are simultaneously actuated, and

in that an energization of a relay means is interrupted during a programmed seat adjustment if, within a predetermined time interval, the actual value of the adjusting motor position coordinated to the relay means and detected by an actual value pick-up means is not changed.

4,523,137

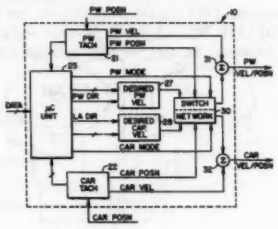
DUAL MODE PRINTER SERVO WITH IMPROVED VELOCITY SIGNAL GENERATOR

Harvey C. Wong, Kensington, Calif., assignor to Mechatron Systems, Inc., Sunnyvale, Calif.

Filed Sep. 27, 1983, Ser. No. 536,551

Int. Cl.³ G05B *19/30*

U.S. Cl. 318—604 7 Claims



1. A method of operating a servo in a rotary printer system having a controlled element selected from the group consisting of a rotary print wheel and a translatable print wheel carriage, a motor for driving the controlled element, a motor driver for providing driving signals for the motor, an encoder for generating position signals corresponding to actual movement of the controlled element, and a control unit for furnishing correction signals to the motor driver, the control unit including means for generating analog desired velocity signals from predetermined digital desired velocity signals and analog actual velocity signals from the encoder position signals, and means for algebraically summing the analog desired velocity signals and the analog actual velocity signals, said method comprising the steps of generating bidirectional analog desired velocity signals having a maximum value range lying both above and below a zero reference level, and summing said bidirectional analog desired velocity signals with the analog actual velocity signals to generate the motor driver correction signals.

4,523,138

DRIVE CONTROL METHOD FOR STEPPING MOTORS

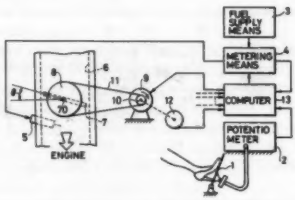
Shigeo Sakurai, Chigasaki, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1983, Ser. No. 557,547

Claims priority, application Japan, Dec. 3, 1982, 57-211368; Aug. 17, 1983, 58-150078

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—685 3 Claims



1. A drive control method for stepping motors for obtaining substantially smaller angular displacement of the rotor than a predetermined unit rotation angle comprising a first step of stopping the rotor of the stepping motor for a first dwell time length at a first angular position rotated by one step from a starting position, a second step of stopping said rotor for a second dwell time length at a second angular position rotated by at least a unit step of the stepping motor from said first

angular position, and a third step of repeatedly actuating said rotor making the combination of the dwell times of said first and second steps one period, a predetermined equivalent intermediate angular position between said first and second angular positions being obtained substantially in time average by selecting the ratio of said first dwell time length to said second dwell time length to be a predetermined value.

4,523,139

ELECTRONIC SWITCHING POWER SUPPLY

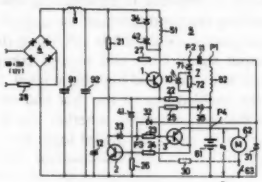
Gerhard Schwarz, Altena, and Günther Bergk, Raunheim, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,460

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218594

Int. Cl.³ H02J *7/04*

U.S. Cl. 320—40 **6 Claims**



1. An electrical switching power supply for supplying power to an electrical load from a variable voltage level AC or DC voltage source having first and second terminals, comprising:

a transformer (5) having a primary coil with first and second terminals and a secondary coil with first and second terminals, said first terminal of said secondary coil being connected to said electrical load;

a first transistor (1) having a base, an emitter and a collector, the emitter-collector-path of said first transistor being coupled in series with said primary coil, the series connection of said emitter-collector-path of said first transistor and said primary coil being electrically coupled to said variable level AC or DC voltage source;

a first diode (31) having a cathode and an anode connected in series with said secondary coil and said electrical load;

a first capacitor (11) connected between said base of said first transistor and said second terminal of said secondary coil;

a second transistor (2) having a base, an emitter and a collector, said collector of said second transistor being connected to said base of said first transistor and said emitter of said second transistor being connected to said second terminal of said voltage source;

a first resistor (21) connected between said first terminal of said voltage source and said base of said first transistor;

a second resistor (22) connected between said first terminal of said secondary coil and said emitter of said first transistor;

a third resistor (23);

a first Zener diode (41) having an anode and a cathode connected between said emitter of said first transistor and said base of said second transistor;

a third transistor (3) having a base, an emitter and a collector, said emitter of said third transistor being connected to said first terminal of said secondary coil;

a second diode (32) having a cathode and an anode;

a third diode (33) having a cathode and an anode, said cathode of said second diode being connected to said second terminal of said secondary coil and said anode of said second diode being connected to both the anode of said third diode and to the base of said third transistor through said third resistor;

a fourth resistor (24) connected between said collector of said third transistor and said base of said second transistor;

a fifth resistor (25) connected between said first terminal of said secondary coil and said collector of said second transistor; and

a discharge circuit connected between said first capacitor and said electrical load;

whereby said first capacitor is electrically charged during a conducting phase of said first transistor, and during a subsequent blocking phase of said first transistor, said electrical load receives the charge build up in said first capacitor during the said conducting phase.

4,523,140

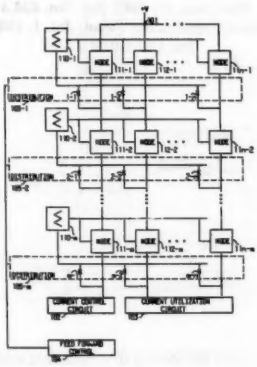
PRECISION CURRENT MIRROR ARRAYS

Herbert A. Schneider, Boulder, Colo., assignor to AT&T Bell Labs, Murray Hill, N.J.

Filed Jan. 3, 1983, Ser. No. 454,958

Int. Cl.³ G05F *3/08*

U.S. Cl. 323—315 **14 Claims**



1. A method of interconnecting control points in an n*m array where n is the number of columns in said array and m is the number of rows in said array, and each node of said array produces a control signal which is proportional to the signal passing through said node comprising the steps of:

summing said control signals on a row-by-row basis;

selecting a fixed number of said nodes in each of said rows on the basis of minimizing the differential between sums of the row numbers of said selected nodes on a columnar basis for the overall array; and

distributing on a row-by-row basis an equal share of said sum of control signals to the columns associated with each of said selected nodes.

4,523,141

PIPE COATING

Samuel J. Thomas, Hamilton; James M. Robich, Watertown, both of Mass., and Robert L. Hayes, Walnut Creek, Calif., assignors to The Kendall Company, Boston, Mass.

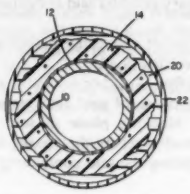
Filed Apr. 16, 1982, Ser. No. 369,036

Int. Cl.³ G01R *31/12*; H01B *7/14*

U.S. Cl. 324—54 **1 Claim**

1. In the method of detecting pinholes and other discontinuities in the outer barrier layer of metal pipe coated with a termal insulating layer of foamed polymeric material having an irregular outer surface and an outer barrier layer of polymeric

material which comprises measuring electrical conductivity or resistivity along the face of said barrier layer,



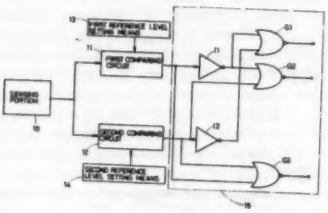
the improvement which comprises interposing between and bonding to said insulating layer and said outer barrier layer an electroconductive intermediate layer.

4,523,142

APPARATUS FOR SENSING DEW AND FROST

Michihiro Murata, Kyoto, and Akira Kumada, Ootsu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 27, 1982, Ser. No. 424,344
Claims priority, application Japan, Jul. 1, 1981, 56-103854
Int. Cl.³ G01R *27/02*
U.S. Cl. 324—65 R **9 Claims**



1. An apparatus for sensing dry, bedewed and frosted states, comprising:

a sensing element including a base material having a permeativity which is less than the permeativity of ice and a pair of electrodes coupled to said base material at spaced locations thereof, the impedance of said sensing element as measured across said electrodes varying as a function of whether said sensing element is in the dry, bedewed or frosted states, said impedance being at a maximum value when said sensing element is in the dry state, said impedance being at a middle value lower than said maximum value when said sensing element is in the frosted state, said impedance being at a minimum value lower than said maximum and minimum values when said sensing element is in the bedewed state; and

means for measuring the impedance between said electrodes and generating electric signals indicative of whether said sensing element is in the dry, bedewed or frosted state.

4,523,143

DIGITAL LOGIC LEVEL COMPARATOR PARTICULARLY FOR DIGITAL TEST SYSTEMS

Robert V. Dvorak, Scotia, N.Y., assignor to Fairchild Camera and Instrument Corporation, Clifton Park, N.Y.

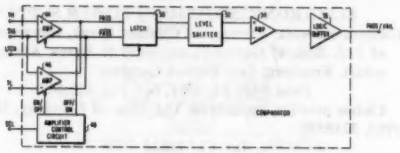
Filed Jun. 18, 1982, Ser. No. 389,880
Int. Cl.³ G01R *19/165*
U.S. Cl. 324—133 **13 Claims**

1. Apparatus for determining whether a digital test signal qualifies as an expected digital logic level comprising:

first comparing means for producing an output signal in response to a level of the digital test signal above a predetermined high threshold level;

second comparing means for producing an output signal in response to a level of the digital test signal below a predetermined low threshold level; and,

control means for inhibiting the production of the output signal from said first comparing means while enabling the production of the output signal from said second comparing means in response to an expected low logic level and for enabling the production of the output signal from said first comparing means while inhibiting the production of the output signal from said second comparing means in response to an expected high logic level, the output signal from the enabled one of the first and second comparing means thereby indicating whether the digital test signal qualifies as an expected digital logic level.

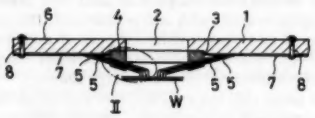


4,523,144

COMPLEX PROBE CARD FOR TESTING A SEMICONDUCTOR WAFER

Masao Okubo, and Yasuro Yoshimitsu, both of Tokyo, Japan, assignors to Japan Electronic Materials Corp., Amagasakishi, Japan

Filed May 21, 1981, Ser. No. 266,054
Claims priority, application Japan, May 27, 1980, 55-73548[U]; Jul. 3, 1980, 55-91356
Int. Cl.³ G01R *1/06, 31/02*
U.S. Cl. 324—158 P **1 Claim**



1. A probe card for testing semiconductor wafers comprising:

a printed circuit plate having an aperture at the center thereof and a ring fixed around said aperture on a bottom side of said printed circuit plate,

said ring having an underside with an inwardly declining surface,

probe needles arranged in radial arrays with respect to said aperture, each of said radial arrays having multiple layers of probe needles,

an adhesive layer for suspending said multiple layers of probe needles parallel to the inwardly declining surface of said ring,

said probe needles having tapered terminal tips aligned on a plane in parallel with but spaced from said printed circuit plate and opposite uniformly thick terminal ends connected to said printed circuit plate for external connection,

wherein said probe needles in inner layers are longer than said probe needles in outer layers, and

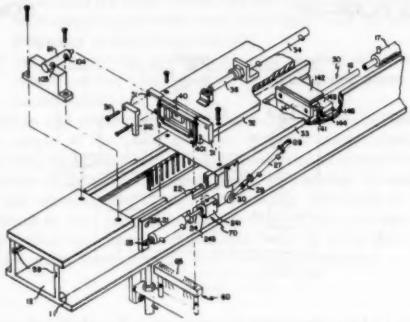
wherein said aperture is large sufficiently to allow said tapered terminal tips of said probe needles to be visually located and readily adjusted from both behind and in front of said printed circuit plate.

4,523,145

APPARATUS FOR THE AUTOMATED HANDLING AND TESTING OF ELECTRONIC MODULES

George G. Gray, Jr., Mattapoisett, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 7, 1982, Ser. No. 395,953
Int. Cl.³ G01R 31/02, 15/12
U.S. Cl. 324—158 F 10 Claims



1. Apparatus for use with an electrical test set for electrical testing of electronic modules comprising:

a container means containing a plurality of electronic modules arranged in successive locations in said container means, each module having electrical connector pins;

means moving said container means so that each of said modules is sequentially located at a predetermined location;

connector means at said predetermined location responsive to each successive module at said predetermined location to move to sequentially electrically connect each said module pins to said electrical test set; and

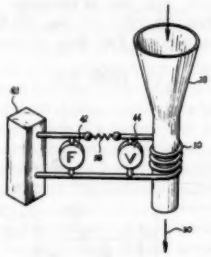
means responsive to the output signal of said test set actuating said moving means to cause the next successive location of said modules to advance to said predetermined location.

4,523,146

MASS FLOW INDICATOR FOR METAL PARTICLES

Jack M. Champaigne, 502 E. LaSalle Ave., South Bend, Ind. 46617

Division of Ser. No. 390,254, Jun. 21, 1982, abandoned. This application Feb. 22, 1984, Ser. No. 582,298
Int. Cl.³ G01N 27/74
U.S. Cl. 324—204 2 Claims



1. A method of determining the size of metal particles as such particles pass along a flow path comprising the steps:

(a) Establishing an oscillatory signal in a coil of an inductive tuned circuit placed within said flow path;

(b) Varying the frequency of said signal during periods of flow and no flow for a specific size of said particles along said flow path and determining that particular frequency at which the amplitude of said signal is substantially constant; and

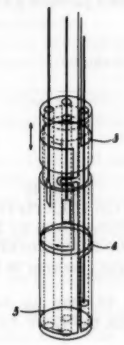
(c) Driving said coil at said particular frequency while passing said particles along said flow path through the coil and observing any changes in signal amplitude, said changes in signal amplitude being correlated to changes in particle size.

4,523,147

FINE BALANCING SECOND DERIVATIVE GRADIOMETER

Silvano D'Angelo, Rome; Ivo Modena, Grottaferrata, and Gian L. Romani, Rome, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Jul. 28, 1982, Ser. No. 402,679
Claims priority, application Italy, Jul. 31, 1981, 49023 A/81
Int. Cl.³ G01R 33/02
U.S. Cl. 324—248 3 Claims



1. A fine balancing 2nd derivative gradiometer with three coils including an upper coil and a lower coil each having N turns, and a central coil having 2N turns and being wound inversely to said upper and lower coils, comprising a support member for said coils consisting of two coaxial elements, the first of said elements bearing said central coil and said lower coil, and the second element bearing said upper coil as well as adjusting means for controlling a micrometric variation of the distance between said upper coil and said central coil by movement of said second element in order to achieve the desired fine balancing.

4,523,148

METHOD AND APPARATUS FOR DETERMINING THE SPONTANEOUS EARTH POTENTIAL LOG FROM DOWNHOLE GRADIENT MEASUREMENTS

Walter J. Maciejewski, Plano, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 198,587, Oct. 20, 1980, abandoned. This application Jul. 13, 1981, Ser. No. 282,394
Int. Cl.³ G01V 3/18, 3/38
U.S. Cl. 324—351 14 Claims

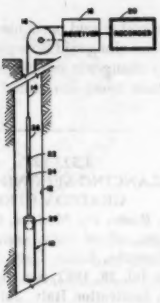
1. A method of logging an earth formation comprising the steps of:

(a) measuring the difference of an earth variable between two closely spaced positions within a well bore;

(b) establishing a window of such measurements adjacent to the position of the measurement of step (a);

(c) establishing the average value of said measurements within said window;

(d) subtracting a weighted portion of said average value within said window from said measurement of step (a); and



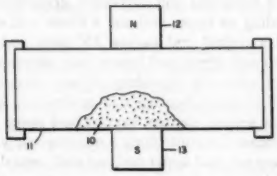
(e) repeating steps (a) through (b) at successive depths within said well bore, thereby producing a differential well log.

4,523,149

METHOD FOR IDENTIFYING SELECT NON-MAGNETIC MINERALS IN THE PRESENCE OF MAGNETIC MINERALS

Eric P. Dion, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,445
Int. Cl.³ G01V *3/00*
U.S. Cl. 324—377 **2 Claims**



1. A method for identifying select non-magnetic minerals in the presence of magnetic minerals in earth formations, comprising the steps of:

(a) obtaining a core sample from an earth formation whose magnetic and non-magnetic material contents all to be determined,

(b) subjecting said core sample of said earth formation to a magnetizing field to attract said magnetic minerals,

(c) separating the magnetic and non-magnetic fractions of said sample while said sample is under the influence of said magnetizing field,

(d) weighing the fractions of said separated magnetic sand on-magnetic fractions,

(e) determining the weight percentage of said magnetic fraction, and

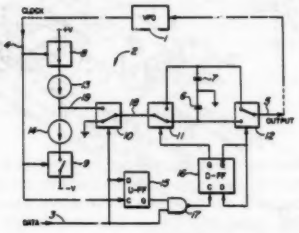
(f) quantifying the abundance of select minerals in said non-magnetic fraction based upon the weight percentage of said magnetic fraction as compared to previous recordings of relative weight percents.

4,523,150

PHASE COMPARATOR USING TWO CAPACITORS ALTERNATELY CHARGED VIA CONSTANT CURRENT SOURCES

John G. Hogeboom, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 27, 1982, Ser. No. 423,617
Claims priority, application Canada, Aug. 18, 1982, 409618
Int. Cl.³ H03L *7/08*
U.S. Cl. 328—133 **5 Claims**



1. A phase comparator for comparing the relative phases of a clock signal and a return-to-zero data signal, the phase comparator comprising:

inputs for the clock signal and the data signal, and an output;

two capacitors each having first and second terminals, the first terminals being coupled to a point of reference potential;

means for coupling the second terminals of the two capacitors alternately to the output;

means coupled to the data signal input for enabling, when the data signal has a first state, charging of that one of the two capacitors whose second terminal is not coupled to the output;

means coupled to the clock signal input for charging said one capacitor, when charging is enabled, in opposite directions during respective half cycles of the clock signal; and

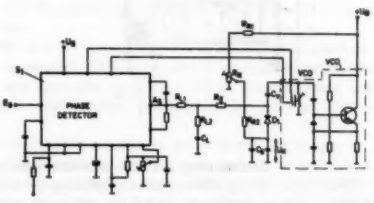
means for controlling the means for coupling the second terminals of the two capacitors to interchange the connections thereof in response to the data signal adopting a second state.

4,523,151

LINEARIZED PHASE LOCK LOOP FM-DEMODULATOR

Werner Bauerschmidt, Zirndorf, Fed. Rep. of Germany, assignor to Grundig E. M. V., Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,925
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114595
Int. Cl.³ H03L *7/00*
U.S. Cl. 329—124 **4 Claims**



1. A circuit for minimizing the nonlinearity in the zero-axis

crossing of a phaselocked loop of an FM-demodulator including:

a phase detector which receives an input signal and produces an output signal corresponding to the phase of said input signal and a center frequency;

a circuit means for producing a circuit output signal in accordance with said phase detector output signal, said circuit means being adjustable to control the zero crossing linearity of the phase detector by producing a zero voltage level output signal when said input signal is at the center frequency of said phase detector;

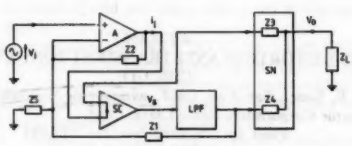
a voltage controlled oscillator coupled between said circuit means and said phase detector to regulate said phase detector output; and

wherein said circuit means includes a filter means coupled to the output of the phase detector; capacitor means coupled between the voltage controlled oscillator and an element with variable capacitance; decoupler means for coupling the output to said element; and an adjustment means connected to the element to vary the voltage at the element and correspondingly allow for a zero voltage output from the phase detector at the center frequency of a signal being demodulated.

4,523,152
HIGH-EFFICIENCY FEEDFORWARD-ERROR-CORRECTION AMPLIFIER

Peter Garde, Bronte, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Mar. 30, 1983, Ser. No. 481,358
Claims priority, application Australia, Apr. 1, 1982, PF3424
Int. Cl.³ H03F *21/00*
U.S. Cl. 330—151 **15 Claims**

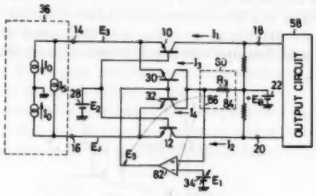


1. A high-efficiency feedforward-error-correction amplifier system comprising a high-efficiency switching circuit having a control input and an output, a low-distortion linear-amplification means having an input and an output, a summing network having a plurality of inputs, and a system output port, wherein a system input signal is fed to the input of the linear-amplification means, and an output voltage signal produced at the output of the linear-amplification means is fed to one input of the summing network, a signal which is a function of a current flowing in the output of the linear-amplification means is used to control the switching circuit via the control input and a switching output signal is produced at the output of the switching circuit and is fed to another input of the summing network, an output current flowing in the output of the switching circuit having a time rate of change limited by a low-pass-filter means, a sensing signal which is a function of the switching output signal being fed to the input of the linear-amplification means, the sensing signal being such that the output voltage signal is a function of distortion components in the switching output signal, and the summing network combines the switching output signal and the output voltage signal to produce a system output signal at the system output port, the system output signal being a function of the system input signal and having a low level of distortion, and said output port being adapted to have a load connected thereto, such that a current flowing in said load via said output port, when averaged over a period of time, is substantially provided by the switching circuit when said averaged output current is large.

4,523,153
VARIABLE GAIN AMPLIFIER

Yasuhiro Itoh, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,943
Claims priority, application Japan, Apr. 27, 1983, 58-74824; Jan. 31, 1984, 59-15754
Int. Cl.³ H03G *3/18;* H03F *3/45*
U.S. Cl. 330—254 **19 Claims**



1. A variable gain amplifier system comprising:

(a) input means having first and second input terminals for receiving differential inputs;

(b) output means having first and second output terminals for providing differential outputs in response to the differential inputs;

(c) a first transistor having an emitter connected to the first input terminal and a collector connected to the first output terminal;

(d) a second transistor having an emitter connected to the second input terminal, a collector connected to the second output terminal, and a base connected to a base of the first transistor;

(e) the first and second transistors making up a first pair of transistors;

(f) a third transistor having an emitter connected to the first input terminal;

(g) a fourth transistor having an emitter connected to the second input terminal and a base connected to a base of the third transistor;

(h) the third and fourth transistors making up a second pair of transistors;

(i) collector bias means for biasing the collectors of the second pair of transistors;

(j) collector current sensing means for providing a voltage representative of the sum of the collector currents of either of the first and second pairs of transistors;

(k) a variable voltage source for providing a variable gain control voltage for controllably varying the current gain between the first input terminal and the first output terminal and between the second input terminal and the second output terminal;

(l) a differential amplifier for applying to the bases of either of the first and second pairs of transistors a voltage proportional to the difference between the output voltage of the collector current sensing means and the gain control voltage from the variable voltage source; and

(m) base bias means connected to the bases of the other of the first and second pairs of transistors.

4,523,154
ENHANCED-ACCURACY SEMICONDUCTOR POWER AMPLIFIER

James S. Congdon, Maynard, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed May 18, 1983, Ser. No. 495,670
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—266 **3 Claims**

1. A DC electronic amplifier comprising:

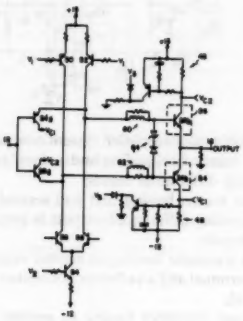
A. a first semiconductor substrate of n-type semiconductor material;

B. a second semiconductor substrate of p-type semiconductor material;

C. first and second npn transistors formed on said n-type substrate;

D. first and second pnp transistors formed on said p-type substrate; and

E. amplifier circuit means interconnecting said first and second transistors of said n-type and p-type substrates as an amplifier in which said second npn and pnp transistors form an output stage in which their emitters are connected together in a complementary emitter-follower configuration for driving an amplifier load connected to said emitters, said first npn and pnp transistors being arranged in a



previous stage with their bases connected together in a complementary emitter-follower stage, the emitter of each first transistor on a substrate being coupled to the base of the second transistor on the other substrate so that the sum of the base-to-emitter voltages of said first transistors is applied between the bases of said second transistors, whereby a temperature increase in a second transistor also occurs in the first transistor on the same substrate, reducing its diode drop and thus reducing the voltage impressed across the series combination of said base-emitter junctions of said second transistors, thermal runaway in a second transistor on a substrate thereby being counteracted by the action of the first transistor on the same substrate.

4,523,155

TEMPERATURE COMPENSATED AUTOMATIC OUTPUT CONTROL CIRCUITRY FOR RF SIGNAL POWER AMPLIFIERS WITH WIDE DYNAMIC RANGE

Thomas J. Walczak, Palatine; Richard M. Stone, Schaumburg, and Gary M. Cristiano, Itasca, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 491,499, May 4, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,805

Int. Cl.[3] H03G *3/30*

U.S. Cl. 330—279 **85 Claims**

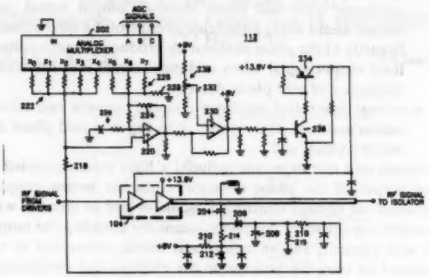
1. Control circuitry for maintaining the magnitude of a radio frequency (RF) signal from an RF signal amplifier at one of a plurality of levels selected by level control signals from a signal source, the amplification of the RF signal amplifier being proportional to a drive current signal provided by current amplifying means, and the current amplifying means varying the magnitude of the drive current signal in response to a current control signal, said control circuitry comprising:

means coupled to the RF signal amplifier for generating an output power signal having a magnitude that is proportional to the magnitude of the RF signal from the RF signal amplifier;

means coupled to the generating means for compensating the output power signal for variations in temperature;

means coupled to the level control signals for selecting one of a plurality of amplification factors in response to the level control signals;

means coupled to the generating means for amplifying the output power signal by the selected amplification factor; and



means coupled to the amplifying means for varying the magnitude of the current control signal in response to the difference between the magnitude of the amplified output power signal and a predetermined magnitude.

4,523,156

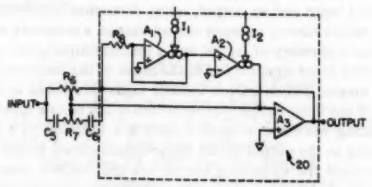
ANTI-DISTORTION ANTI-TRANSIENT TONE CONTROL CIRCUIT

Don R. Sauer, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 25, 1983, Ser. No. 517,185

Int. Cl.[3] H03G *9/16*

U.S. Cl. 330—282 **12 Claims**



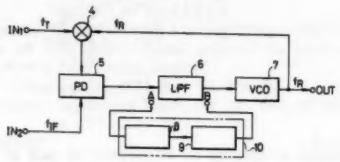
8. In a tone control circuit, including an amplifier having a continuously adjustable frequency response control operable to vary the effect of low and high frequency filters upon said amplifier, a method for suppressing amplifier output distortion and transient interference, comprising:

varying the gain of a transconductance amplifying circuit coupled between an inverting input and an output of said amplifier in response to a programming distortion/transient control signal to attenuate circuit low frequency response as the gain of said transconductance amplifying circuit is initially varied in response to said programming distortion/transient control signal and to thereafter reduce overall amplifier gain as the gain of said transconductance amplifying circuit is further varied in response to said programming distortion/transient control signal.

4,523,157
PLL OUT-OF-CAPTURE RANGE DETECTION AND LOCK ACQUISITION CIRCUIT

Yu Sato, Tokyo, Japan, assignor to Nippon Kogaku K. K., Japan

Filed Sep. 24, 1982, Ser. No. 422,952
Claims priority, application Japan, Oct. 27, 1981, 56-170738
Int. Cl.³ H03L 7/08
U.S. Cl. 331—4 2 Claims



1. A phase locked loop (PLL) frequency tracking circuit for receiving a variable frequency (f_T) signal at a first input port (IN1) and a predetermined frequency (f_{IF}) signal at a second input port (IN2) and producing at an output port (OUT) an output signal having a frequency equal to the absolute value of the sum or difference of the two frequencies (f_T, f_{IF}) of the signals received at the first and second input ports, said circuit having a predetermined lock range, and including:

a mixer provided with a pair of input terminals and an output terminal, one input terminal of said pair being connected to said first input port and the other input terminal of said pair being connected to said output port,

a phase detector provided with a pair of input terminals and an output terminal, one input terminal of said pair being connected to the mixer output terminal and the other input terminal of said pair being connected to the second input port,

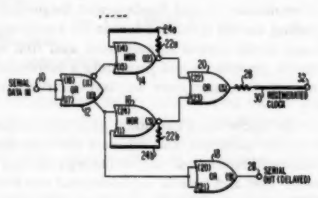
a voltage controlled oscillator (VCO) provided with an input terminal and an output terminal, the input terminal being connected to the phase detector output terminal and the output terminal being connected to the said other mixer input terminal, characterized in that

the PLL frequency tracking circuit further comprises a detection-control circuit connected between said phase detector output terminal and said VCO input terminal for detecting that the PLL is out of its lock range and upon the detection temporarily applying to the VCO a predetermined voltage which adjusts the oscillating frequency of the VCO to a frequency at which the PLL is in its lock range and is able to perform phase locked loop locking for said variable frequency (f_T) signal.

4,523,158
CLOCK REGENERATOR USING TWO ON-OFF OSCILLATORS

Mohamed M. A. Megeid, Zurich, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 2, 1983, Ser. No. 463,165
Int. Cl.³ H03L 7/24; H04L 27/12
U.S. Cl. 331—55 1 Claim



1. Apparatus comprising

a first OR gate having a pair of inputs for receiving data signals, and a complementary pair of outputs;

a pair of oscillators for producing output signals having substantially the same frequency, each oscillator comprising a NOR gate having a first input coupled to a respective one of said first OR gate outputs, a second input, and an output, and a transmission line coupled between said output and said second input;

a second OR gate having a pair of inputs both coupled to one of said first OR gate outputs, and an output for providing delayed data pulses;

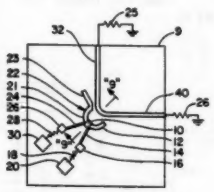
a third OR gate having a pair of inputs respectively coupled to said NOR gate outputs, and an output for providing regenerated clock pulses;

and a transmission line means for delaying said regenerated clock pulses so that the positive going edges thereof occur approximately in the middle of said delayed data pulses.

4,523,159
MICROWAVE OSCILLATOR AND SINGLE BALANCED MIXER FOR SATELLITE TELEVISION RECEIVER

Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 28, 1983, Ser. No. 566,237
Int. Cl.³ H03B 5/18; H04B 1/28
U.S. Cl. 331—99 10 Claims



1. A high frequency oscillator comprising:

a substrate having opposed top and bottom surfaces;

a conductive ground plane on said bottom surface;

a shielded dielectric resonator disposed adjacent to and below said bottom surface;

transistor means disposed within a hole extending through said substrate and having a common electrode electrically connected to said ground plane, and input and output electrodes;

first and second transmission line strips on said top surface and electrically connected to said input and output electrodes of said transistor means; and

first and second series of magnetic field coupling slots, of at least one slot each, formed in said ground plane and disposed for coupling the magnetic field developed by said dielectric resonator to said first and second transmission line strips, respectively, thereby forming a closed feedback loop.

4,523,160
WAVEGUIDE POLARIZER HAVING CONDUCTIVE AND DIELECTRIC LOADING SLABS TO ALTER POLARIZATION OF WAVES

George Ploussios, 4 Hackney Cir., Andover, Mass. 01810

Filed May 2, 1983, Ser. No. 490,346
Int. Cl.³ H01P 1/161
U.S. Cl. 333—21 A 3 Claims

3. The method of making a polarizing waveguide comprising the steps of

providing a waveguide section having internal conductive surfaces defining a center portion free of obstructions and capable of propagating two orthogonal waves,

positioning two conductive loading slabs respectively along opposing internal surfaces of said waveguide section, and

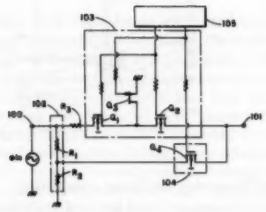
positioning first and second slabs of dielectric material spaced from and opposite each other and extending along opposing internal surfaces of said waveguide section.

4,523,161

PROGRAMMABLE ATTENUATOR

Frank Miles, Ann Arbor, Mich., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 22, 1983, Ser. No. 534,897
Claims priority, application Japan, Oct. 27, 1982, 57-188904
Int. Cl.³ H03H *7/24*
U.S. Cl. 333—81 R **1 Claim**



1. A programmable attenuator, comprising:

first and second resistors connected in series between an input terminal and ground;

first electronic switch means connected between the input terminal and an output terminal;

second electronic switch means connected between the junction of said first and second resistors and the output terminal; and

control means for operating said first and second electronic switch means, wherein said second electronic switch means includes a single transistor while said first electronic switch means includes a pair of series-connected transistors and an additional shunt transistor connected between the junction of said series transistors and ground.

4,523,162

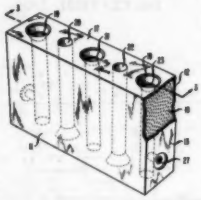
MICROWAVE CIRCUIT DEVICE AND METHOD FOR FABRICATION

Arlen K. Johnson, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 15, 1983, Ser. No. 523,146
Int. Cl.³ H01P *1/205*
U.S. Cl. 333—202 **11 Claims**

4. An electric signal filter comprising a block of dielectric material having a plurality of holes therethrough each having a center line intersecting two faces of said block, said holes being parallel to one another and having their center lines in a plane, said block having substantially uniform width and height through each of its regions between a pair of adjacent ones of said holes, said width and height being proportioned in relation to diameters of said holes to establish a predetermined bandwidth for said filter, and

electric signal conductive material coated over outer and inner surfaces of said block, except in a predetermined



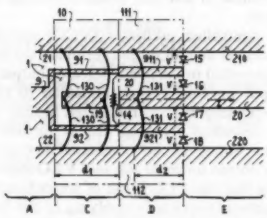
region comprising an intersection of each of said holes with one of said faces, said excepted intersecting region being dimensioned to determine fine-tuning of said filter, said material having an electrical conductivity which is much larger than the conductivity of said dielectric material.

4,523,163

WIDEBAND MICROWAVE DEVICE GENERATING EVEN HARMONICS OF AN INCIDENT SIGNAL

Michel Houdart; Edouard Arruberrenal, and Frédéric Maurette, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 24, 1982, Ser. No. 423,317
Claims priority, application France, Oct. 23, 1981, 81 19939
Int. Cl.³ H03B *19/00*
U.S. Cl. 333—218 **3 Claims**



1. A microwave harmonic generator, comprising:

an equiphase divider having an input structure for conducting an input signal at a fundamental frequency with an asymmetrical propagation mode and first and second output structures, each for conducting an output signal at the fundamental frequency with an asymmetrical propagation mode;

first and second even harmonic generator structures, each having an input structure coupled to a corresponding output structure of said equiphase divider, each harmonic generator providing an output signal on an output structure thereof in a symmetrical propagation mode including even harmonics of said fundamental frequency; and

a combining circuit structure means for receiving said symmetrical mode output signals from said first and second harmonic generators and providing a combined signal on an output structure over an asymmetrical propagation mode,

wherein the microwave harmonic generator is fabricated on a dielectric substrate, and wherein the equiphase divider includes said input structure including a central conductor between first and second equipotential earth planes, said central conductor dividing into first and second conductors with a third earth plane therebetween, the third earth plane being made equipotential with the first and second

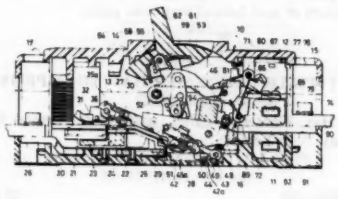
earth planes by short circuits, the first and second conductors each forming with the third earth plane and the first and second earth planes respective first and second coplanar lines, which form the first and second output structures respectively, the first and second coplanar lines being resistor coupled to each other at respective output ends thereof.

4,523,164

CIRCUIT BREAKER

Youichi Aoyama; Akira Takeuchi; Masaru Ohmuro, and Yasuo Ichimura, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 26, 1984, Ser. No. 634,692
Claims priority, application Japan, Jul. 31, 1983, 58-140180
Int. Cl.³ H01H *75/10, 77/06*
U.S. Cl. 335—38 **8 Claims**



1. A circuit breaker comprising a make-and-break contact means including a fixed contactor plate having a fixed contact and a movable contactor plate having a movable contact separably contacted with said fixed contact, means for manually making and breaking said contact means, an arm means operatively coupled to said manual make and break means for holding said movable contactor plate, an armature means pivoted at one end to said arm means, a spring means provided between the other end of said armature means and the movable contactor plate so that a line passing through said spring means lies on the contact making side with respect to a pivot point of the armature means upon contact make motion of the movable contactor plate but lies on the contact breaking side with respect to said pivot point upon contact breaking motion of the movable contactor plate, means for generating a magnetic force which causes the armature means to be rotated in its contact breaking direction when an overcurrent flows through an electric path including the contact means, and means responsive to said overcurrent for tripping the manual make-and-break means from its contact making state to a tripped state.

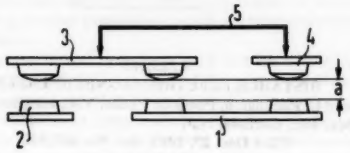
4,523,165

CONTACT ARRANGEMENT FOR RELAYS

Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,401
Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217528
Int. Cl.³ H01H *67/00*
U.S. Cl. 335—106 **2 Claims**

1. A relay comprising:
housing means;
an electromagnet carried by said housing means including a coil body flange having grooves therein and an armature;
a pair of stationary bridging contacts fixedly mounted spaced from one another in respective ones of said grooves;
a pair of stationary contacts mounted in said housing means spaced from one another; and
an additional single contact and an additional bridging contact coupled to said armature and mounted between said fixedly mounted contacts as transfer contacts and so



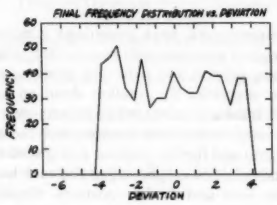
positioned to provide a series circuit connection of contacts in either operative state of said relay.

4,523,166

OPTIMAL FIELD INHOMOGENEITY CORRECTION COIL OPERATION FOR NMR MAGNETS

Dan A. Gross, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,744
Int. Cl.³ H01F *7/22*
U.S. Cl. 335—216 **8 Claims**



1. A method for operating correction coils to achieve a uniform magnetic field comprising the following steps:

(a) measuring the magnetic field, with no current in the correction coils, at a plurality N of points within the volume for which uniformity is desired, the value of the field at the i^{th} measurement point p_i being denoted by $F(p_i)$;

(b) determining a preliminary estimate for correction coil current $I_1, I_2, \ldots, I_S$ for S correction coils by a least squares minimization of

$$\chi^2 = \sum_{n=1}^{N} \chi_i^2 = \sum_{n=1}^{N} [(F(p_i) - P(p_i))/\delta_i]^2,$$

where

$$P(p_i) = \sum_{n=1}^{S} I_n P_n(p_i).$$

and where $P_n(p_i)$ is a polynomial function expressing the field contribution of correction coil n at point p_i with one unit of current in correction coil n, and where δ_i is a non-zero weight assigned to each point p_i;

(c) determining a new set of weights $\delta_i^{(new)}$ for each measurement point according to:

$$\delta_i^{(new)} = \delta_i^{(old)}[1 + a|X_i|/R]^{-1},$$

where $R = \max(X_1, X_2, \ldots, X_N) - \min(X_1, X_2, \ldots, X_N)$ and where a is a positive convergence constant less than 1;

(d) repeating steps (b) and (c) at least once with δ_i in step (b) replaced by $\delta_i^{(new)}$ from step (a), so as to determine new values for correction current $I_1, I_2, \ldots, I_S$; and

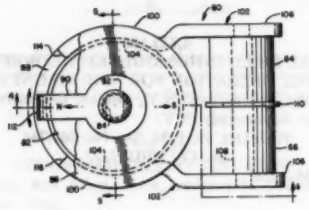
(e) applying said new values of currents I_1, I_2, . . . , I_S to correction coils 1 through S, respectively.

4,523,167

BISTABLE ELECTROMAGNETIC LATCH

Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Dec. 27, 1982, Ser. No. 453,130
Int. Cl.³ H01F 7/08
U.S. Cl. 335—230 **4 Claims**



1. An electromagnetic latch comprising a magnetic circuit including a pair of magnetic pole pieces, each pole piece having an arcuate portion and a further portion, a permanent magnet rotor supported for rotation about an axis centered between said arcuate portions with said arcuate portions embracing said rotor, said arcuate portions each having first ends not merging into said further portions and spaced to define the respective ends of a first magnetic gap and each having second ends merging into said further portions, respectively, and defining respective ends of a second magnetic gap, said gaps subtending substantially equal angles about said axis, said magnetic rotor having opposite magnetic poles associated with said magnetic gaps, respectively, each magnetic pole being rotatable between the ends of the associated magnetic gap, whereby alternate magnetic paths of low reluctance and corresponding stable positions of the rotor are defined when each magnetic pole of the rotor is adjacent to either end of the associated magnetic gap, and coil means connected to said further portions of said pole pieces and responsive to the momentary flow of electrical current therethrough for producing a magnetic flux in the magnetic circuit that causes the rotor to move from one stable position to the other.

4,523,168

ELECTROMAGNET

Roy M. Emanuelson, Reading, and David P. Lebet, Ipswich, both of Mass., assignors to Scanditronix Inc., Essex, Mass.

Continuation of Ser. No. 424,643, Sep. 27, 1982, abandoned. This application Feb. 29, 1984, Ser. No. 583,785
Int. Cl.³ H01F 7/00
U.S. Cl. 335—296 **10 Claims**

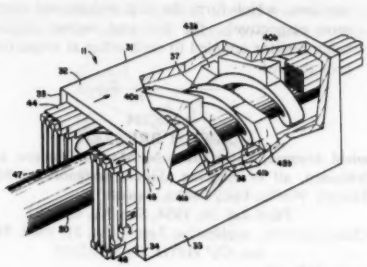
1. An electromagnet comprising:

(a) first and second interjacent open helical magnet pole means coaxial with a longitudinal axis,

(b) magnet yoke means surrounding and spaced from said pole means,

(c) first and second angularly displaced magnetic coupling means interconnecting said magnet yoke means and said first and second pole means respectively thereby to define a high permeability magnetic path with said first and second pole means and said magnet yoke means, and

(d) means for inducing magnetic flux in said coupling means thereby producing a magnetic field having a direction that



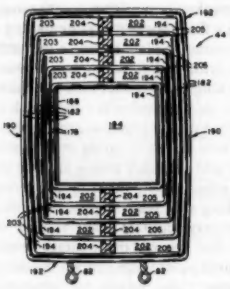
is angularly displaced along the axis in accordance with the pitch of said helical magnetic poles.

4,523,169

DRY TYPE TRANSFORMER HAVING IMPROVED DUCTING

Noah D. Hay, Huntertown, Ind., assignor to General Electric Company, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,736
Int. Cl.³ H01F 27/08
U.S. Cl. 336—60 **29 Claims**



1. A dry-type air cooled transformer comprising:

a magnetic core having a core window,

a coil comprising a plurality of superimposed layers of wound conductor surrounding a vacant coil window extending axially through the coil, each layer comprising a plurality of conductor turns an wherein each layer extends in a direction generally parallel to the coil axis,

said coil being generally reactangular in planes perpendicular to the coil axis and having two end portions and two side portions, one of said side portions being disposed within said core window,

at least some of the conductor layers in one of said end portions being spaced apart in a direction perpendicular to the coil axis to form a plurality of air ducts extending generally parallel to the coil axis and adapted to permit air to flow between the spaced layers to cool the coil, and

a plurality of duct spacer means respectively in said air ducts to space apart the adjacent conductor layers defining the respective duct, said duct spacer means being an elongate, electrically insulative element, said element having an axial dimension in the direction of the coil axis much greater than dimensions in directions transverse to the coil axis,

in at least some of said ducts therein being only one duct spacer means per duct, said duct spacer spaced inwardly toward a center portion of the duct away from the coil

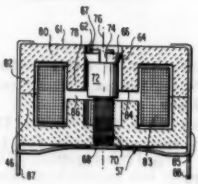
side portions and forming two channels in said duct which are open from said spacer to said coil side portions, said channels occupying substantially all the space in said duct, said spacer means extending substantially from one end of the duct to the other in the axial direction, each of said ducts being devoid of any other elements to space apart the conductor layers forming the duct other than the one duct spacer means therein.

4,523,170

ADJUSTABLE AIR GAP FERRITE STRUCTURES AND METHODS OF MANUFACTURE

Joseph F. Huth, III, Butler, Pa., assignor to Spang & Company, Butler, Pa.

Filed Nov. 5, 1982, Ser. No. 439,370
Int. Cl.³ H01F *21/06*
U.S. Cl. 336—83 **3 Claims**



1. Method for manufacturing a magnetically-soft ferrite core part to provide unitary means for accurately adjusting the inductance of an electrical inductance device which includes such core part, comprising

providing a substantially homogeneous mass of particulate ferrimagnetic material which is reactive when treated at elevated temperatures to form a magnetically-soft ceramic ferrite,

molding such ferrimagnetic material at elevated pressure to form a unitary greem compact, such green compact including

an elongated center post symmetrically distributed about a centrally located longitudinal axis,

a web portion extending in transverse relationship to such axis contiguous to one longitudinal end of such center post, and

a skirt portion extending from such web in spaced relationship from such center post and extending in an axial direction to define a space for receiving coil windings between such center post and such skirt portion,

such center post defining a central opening extending longitudinally with and substantially symmetrically about such longitudinal axis,

such central opening presenting interior wall surface means of circular cross section in a plane transverse to such longitudinal axis,

such interior wall surface means including a wall surface portion of reduced diameter with respect to the remainder of such interior wall surface means,

such reduced diameter wall surface portion being established during pressure compaction and being contiguous to such one longitudinal end of the center post from which such web portion extends,

forming unitary helical threads solely in such reduced diameter portion of the central opening interior wall surface means,

such helical threads being formed in such reduced diameter portion of such interior wall surface means of such pressure molded unitary green compact, and thereafter

sintering such green compact at elevated temperature to form a ceramic core part with unitary helical threads established along at least a predetermined portion of its central wall surface means extending longitudinally along its central opening within its center post for receiving an externally-threaded nonmagnetic portion of an elongated male tuning member when such tuning member is inserted axially into such central opening,

such externally-threaded nonmagnetic portion of such male tuning member presenting threads of predetermined specifications,

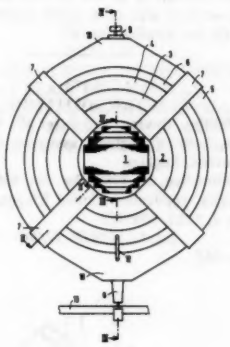
the unitary helical threads in such portion of the central opening wall surface means of the pressure molded unitary green compact being formed with predetermined specifications to compensate for shrinkage of such unitary green compact during sintering so as to accommodate such threads of predetermined specifications presented by such externally-threaded nonmagnetic portions of such male tuning member.

4,523,171

DRY-TYPE TRANSFORMER WITH WINDINGS CAST IN CASTING RESIN

Gerhard Altmann, Kirchheim; Friedrich Alber, Köngen, and Lothar Brzuska, Wernau, all of Fed. Rep. of Germany, assignors to Transformatoren Union AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1983, Ser. No. 520,720
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3229480
Int. Cl.³ H01F *27/02*
U.S. Cl. 336—96 **9 Claims**



1. Dry-type transformer cast into casting resin, comprising windings, a main cooling canal, at least one of said windings being subdivided into coaxial winding parts spaced apart from each other defining an additional axial cooling canal therebetween, separate inner and outer casting resin bodies each having end faces and being cast around a respective one of said winding parts, reinforcements formed on diametrically opposite outer surface regions of said outer casting resin body for receiving axially extended connecting conductors for electrically wiring said winding parts, line terminals and tap terminals disposed on respective reinforcements, and elastic blocks common to all of said windings and winding parts between which said winding parts of a respective winding are clamped, said winding parts of a respective winding being metallically interconnected in front of said end faces of said casting resin bodies.

4,523,172

HIGH VOLTAGE QUICK-BREAK FUSE

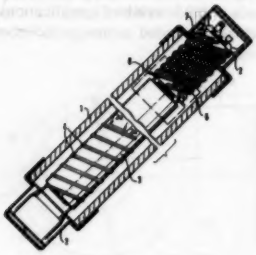
Michael Drothen, and Willi Ressel, both of Witten, Fed. Rep. of Germany, assignors to Wickmann Werke GmbH, Witten, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,696

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237326

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—164 8 Claims



1. A high voltage quick-break fuse comprising: a fuse tube, at least one silver fuse element and at least one tin fuse element in series connection mounted within said tube, said silver fuse element having restricted cross-section areas at intervals along said silver fuse element to influence its characteristics and said tin fuse element being surrounded by an arc-quenching material, wherein the ratio of the total cross-sections of all the tin fuse elements to the total cross-sections of all the silver fuse elements is greater than 6, the ratio of the total cross-sections of all the tin fuse elements to the restricted cross-section area of all the silver fuse elements is greater than 15, and the ratio of the total cross-sections of all the tin fuse elements to the restricted cross-section area of a single silver fuse element is greater than 60, but smaller than 85.

4,523,173

ELECTRIC SWITCHES

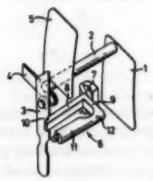
Richard A. Phillips, Buxton, and Peter W. Naylor, Tideswell, Nr. Buxton, both of England, assignors to Otter Controls Limited, Buxton, England

Filed Sep. 26, 1983, Ser. No. 536,118

Claims priority, application United Kingdom, Sep. 27, 1982, 8227498; Feb. 4, 1983, 8303075

Int. Cl.³ H01H *37/54*

U.S. Cl. 337—367 14 Claims



1. An electric switch having manually-releasable latching means associated with an operating member of said switch for latching said operating member in a first predetermined operating condition of said switch and preventing movement of said operating member into a second predetermined operating condition of said switch until said latching means is released, and wherein said manually-releasable latching means includes a latching member comprising a generally L-shaped lever having two limbs and mounted for pivotal movement within the plane of said limbs and generally about the junction of said limbs, and a manually operable release member coupled to the extremity of one of said limbs by means of a resilient hinge portion, said release member serving to enable the manual application of said extremity of said one limb of a force in a direction such as to cause said lever to execute said pivotal movement, said resilient hinge portion serving for accommodating the said pivotal movement of said lever during application of said force, the extremity of the other of said limbs constituting an engaging member for engagement with said operating member of said switch for latching the same in said first predetermined operating condition, the arrangement being such that, when said lever pivots under said force, said extremity of said other limb moves in a direction transverse to the respective limb and out of latching engagement with said operating member so as to enable said switch to return to its said second predetermined operating condition.

4,523,174

ILLUMINATION TYPE ROTARY VARIABLE RESISTOR

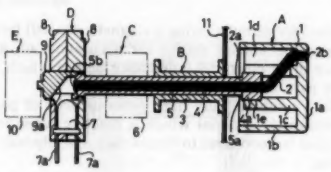
Akira Oyama, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,887

Claims priority, application Japan, Feb. 1, 1983, 58-12033[U]

Int. Cl.³ H01C *10/30*

U.S. Cl. 338—119 5 Claims



1. An illumination type rotary variable resistor comprising a rotatable hollow shaft displaceable axially, a rotatable knob coupled to a forward end of said hollow shaft, a photo-conductive element disposed within said hollow shaft and said knob and having two ends one of which is exposed eccentrically at an end surface of said knob, a light source provided close to the other end of said photo-conductive element, a switch located rearwardly of said hollow shaft, a driver member disposed in contact with the rearward end of said hollow shaft to cause said switch to perform its switching operation upon axial movement of said hollow shaft, and means including, a reflective surface formed on said driver member to reflect light from said light source and to direct the reflected light towards said photo-conductive element regardless of the axial position of said hollow shaft.

4,523,175

DUAL SHAFT ROTARY ELECTRIC DEVICE

Michio Sakurai, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,665

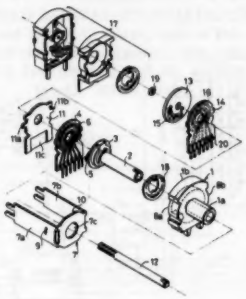
Claims priority, application Japan, Feb. 12, 1983, 58-18111[U]

Int. Cl.³ H01C *10/16;* H01H *19/58*

U.S. Cl. 338—134 6 Claims

1. A dual shaft rotary electric device comprising a dual shaft arrangement constituted by inner and outer concentric shafts, slider supports attached to said inner and outer shafts respectively, sliders attached to said slider supports respectively and insulating substrates stacked in the longitudinal direction of said dual shaft arrangement and respectively correspondingly

to said sliders, in which an insulating spacer is inserted between said insulating substrates and a front plate having side arms



extending generally parallel to said dual shaft arrangement and engaging said spacer to hold it in place.

4,523,176

ELECTRICAL SWITCH

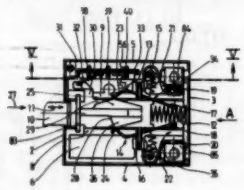
Paul Leibinger, Rietheim-Weilheim, and Alfons Steidle, Spaichingen, both of Fed. Rep. of Germany, assignors to Firma Marquardt GmbH, Rietheim-Weilheim, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 381,759

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121033

Int. Cl.³ H01C *10/36*

U.S. Cl. 338—179 **12 Claims**



1. A switch comprising an actuating member designed as a plunger and carrying a slider, characterized in that the plunger (10) is provided with a retaining groove (72) for the slider (32), extending transversely to a direction (27) of the plunger actuation and bounded at one end by a stop surface (74) and having an L-shaped a cross section to form a strip (77) for backing the slider (32), and that an attachment end portion (73) of the slider (32) is approximately S-shaped, with a free S-leg engaging the backing strip (77) from below while a S-leg blends into slider arms (79,80), and with the web of the retaining groove (72) being larger than the thickness of the attachment end (73) of the slider.

4,523,177

SMALL DIAMETER RADIANT TUBE HEATER

John M. Driggers, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1984, Ser. No. 571,214

Int. Cl.³ H01C *3/20*

U.S. Cl. 338—303 **4 Claims**

1. An electrical resistance heated radiant heating unit for internal heating of steam generator tubes comprising an insulating, refractory, generally cylindrical elongate mandrel that is formed with a lengthwise-extending bore and with enlarged diameter shoulder means at each of its ends respectively, and formed with helical recesses in its surface intermediate said shoulder means,

a bare platinum-rhodium alloy wire disposed in said helical recesses and wound in the form of a generally helical coil having groups of windings in which the adjacent windings within each group of windings are substantially uniformly spaced from each other and said groups of windings are also spaced from each other lengthwise of said mandrel for providing electrical resistance heating,

a pair of bare electrical lead members operatively connected

to opposite ends of said wire respectively and electrically insulated from each other by interposed parts of said mandrel,

one of said lead members being disposed in and extending through said bore,

each of said shoulder means being formed with an aperture for the passage therethrough of one of said lead members, respectively, and

each of said lead members extending through one of said apertures respectively, for electrical connection to the opposite ends of said wire, respectively.

4,523,178

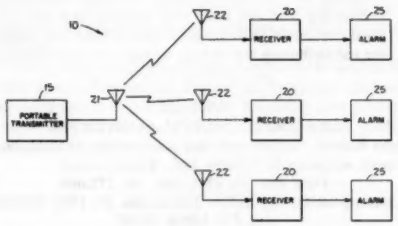
WIRELESS ALARM SYSTEM IN CONJUNCTION WITH AT LEAST ONE VEHICLE

George E. Fulhorst, 2842 Forbes Ave., Santa Clara, Calif. 95051

Filed Feb. 22, 1982, Ser. No. 351,200

Int. Cl.³ G08B *13/08*; B60R *25/04*

U.S. Cl. 340—64 **5 Claims**



1. A wireless alarm system comprising:

(a) a portable radio frequency transmitter for transmitting a coded signal;

(b) a plurality of radio frequency receivers for receiving said coded signal, each of said radio frequency receivers comprising:

(1) first means for detecting said coded signals, and

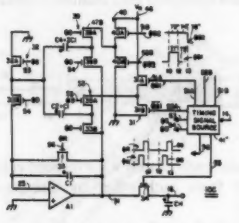
(2) second means activated in response to the detection of said coded signals; and

(c) a plurality of vehicle means activated respectively in response to a plurality of said second means' being activated respectively for indicating an alarm condition.

4,523,179
INTEGRATABLE D/A CONVERTER

Christopher W. Kapral, San Carlos, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Phoenix, Ariz.

Division of Ser. No. 296,733, Aug. 27, 1981, Pat. No. 4,451,820.
This application Dec. 20, 1982, Ser. No. 455,786
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **13 Claims**



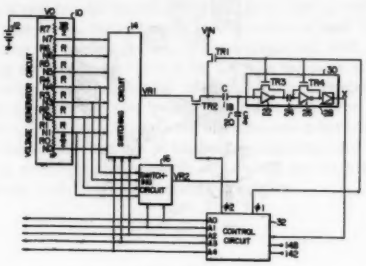
1. An integratable digital to analog converter comprising:
first and second capacitors having capacitances of the same values, and having one and other sides thereof;
a third capacitor having one and other sides and a capacitance twice that of said first capacitor;
a differential input operational amplifier means having an inverting input terminal and an output terminal electrically connected to one and other sides, respectively, of said first-capacitor and having a non-inverting input electrically connected to ground for impressing a virtual ground potential on said inverting input terminal;
first switch means sequentially responsive to unique adjacent pairs of binary bits in ascending order of the bit position in a digital input word for impressing onto first and second bus lines one of a prescribed voltage from a voltage source and the ground reference voltage which may correspond to a binary one and zero, respectively, in the associated bit; the first and second bus line voltages being associated with the least significant bit and most significant bit, respectively, of a bit pair; and
second switch means operative for each bit cycle in said first switch means for first connecting said one sides of said second and third capacitors to ground and said other sides thereof to said first and second bus lines, respectively, for sampling the bus line voltages, and then simultaneously connecting said one and other sides of said second and third capacitors to associated sides of said first capacitor for redistributing the charge voltages on said capacitors.

4,523,180
ANALOG TO DIGITAL CONVERTER

Shigeo Kuboki, Nakaminato, and Kazuo Kato, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,609
Claims priority, application Japan, Jun. 27, 1980, 55-86639
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **10 Claims**

6. An analog to digital converter comprising:
a first voltage providing means for providing a first analog voltage having a magnitude defined by the upper bits of digital data having upper and lower bits;
an input circuit which receives an analog voltage to be converted into a digital signal;
a comparator for producing a comparison result of the first analog voltage with the analog input voltage.
a first capacitor circuit coupled between the output of the first voltage providing means and an input of the comparator;
a second voltage providing means for providing a second analog voltage having a magnitude defined by the lower bits of said digital data;
a second capacitor coupled between the output of the second voltage providing means and the input of the comparator; and

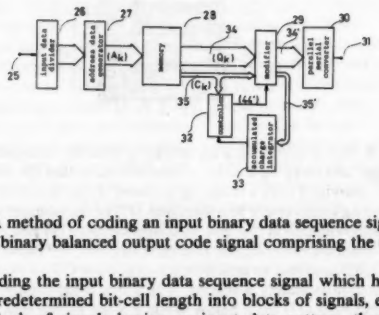


a control circuit which receives the comparison result from the comparator and delivers the first and second digital data.

4,523,181
METHOD AND APPARATUS FOR PRODUCING A BINARY INFORMATION FOR AN INFORMATION TRANSMISSION

Saburo Tazaki, Matsuyama, and Akifumi Ide, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 202,436, Oct. 30, 1980, abandoned.
This application Oct. 28, 1982, Ser. No. 437,460
Claims priority, application Japan, Oct. 31, 1979, 54-141761
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **10 Claims**



1. A method of coding an input binary data sequence signal into a binary balanced output code signal comprising the step of:
dividing the input binary data sequence signal which has a predetermined bit-cell length into blocks of signals, each block of signals having an input data pattern, thereby forming a set of input data block signals;
reading a data block signal and an accumulated charge data representing an integrated value of data over one data block from a ROM by addressing the memory data generating from said input binary data sequence signal for converting said input data block signals into corresponding output data block signals, each output data block signal having a minimum inversion interval which is longer than said predetermined bit-cell length, and a maximum inversion interval which is 7.2 or less times said bit-cell length;
integrating said accumulated charge data;
inverting data of said output data block signal to produce an inverted data block signal at least when the integrated accumulated charge is about to exceed a predetermined finite value and when integration of said accumulated charge data is not zero; and

assembling the non-inverted and inverted data block signals into said binary balanced output code signal.

4,523,182

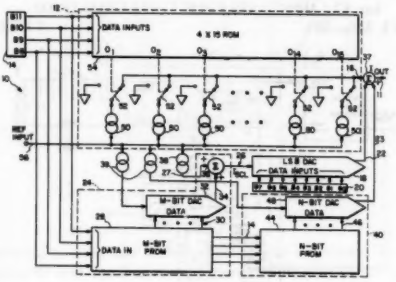
PROM TRIMMED DIGITAL-TO-ANALOG CONVERTER

Barry Harvey, and Robert C. Barry, both of Palo Alto, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 10, 1983, Ser. No. 456,924

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **14 Claims**



1. In an apparatus for converting input binary number signals into an analog output signal, said apparatus having means for converting first binary number signals of said input binary number signals into a first portion of said analog output signal, said first portion corresponding in value to said first binary number signals, said first binary number signals representing bits of more significance than all other input binary number signals (MSB signals) and having means for converting second binary number signals of said input binary number signals into a second portion of said analog output signal, said second binary number signals representing bits of lesser significance than said MSB signals (LSB signals), means for compensating for error in said LSB signals for each value of said MSB signals comprising:

means coupled to receive said MSB signals for supplying a compensated analog scaling value signal to said second binary signal converting means to compensate for step errors over the range of the second portion of the analog output signal.

4,523,183

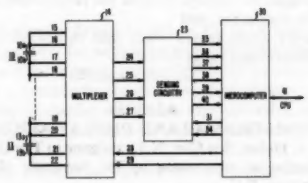
ALARM-FAULT DETECTING SYSTEM

Kenneth L. Frick, Westminster, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 3, 1982, Ser. No. 374,338

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—507 **27 Claims**



1. A signaling system comprising

a first pair of loop conductors,

a second pair of loop conductors,

contact means for signaling an occurrence of an alarm, said contact means comprising a first contact connected to said first pair of loop conductors and a second contact connected to said second pair of loop conductors, and

an electrical network means connected to said first and second pairs of loop conductors and being responsive to impedance conditions of individual ones of said loop conductors and said first and second contacts for producing a plurality of combinational logic voltages the combination of which indicates the operative state of said contact means and sensed fault conditions on said individual conductors.

4,523,184

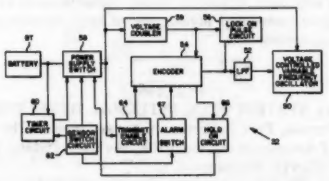
SUPERVISED WIRELESS SECURITY SYSTEM

William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.

Filed Sep. 30, 1982, Ser. No. 429,116

Int. Cl.³ G08B *1/08*

U.S. Cl. 340—539 **5 Claims**



2. A transmitter for use in a wireless security monitoring system, comprising;

(a) a radio frequency oscillator having an actual frequency within a predetermined frequency range of a first predetermined frequency;

(b) encoder means for producing a pulse train including digitally coded address and sensor data;

(c) modulator means interconnecting said encoder means and said radio frequency oscillator for modulating said actual frequency in response to said pulse train to produce a frequency-modulated output signal;

(d) multivibrator means connected to said encoder means for periodically initiating transmission of said output signal;

(e) sensor-responsive means connected to said encoder means for initiating transmission of said output signal in response to detection of a predetermined event by a sensor; and

(f) voltage ramp generating means connected to said modulator means for causing said actual frequency to sweep through said first predetermined frequency at a predetermined rate of change of frequency before said encoder means produces said pulse train.

4,523,185

ZONED INTRUSION DISPLAY WITH SERIES-CONNECTED SENSORS

Albert Roth, 6248 Rockhurst Dr., San Diego, Calif. 92120

Filed Mar. 15, 1982, Ser. No. 358,494

Int. Cl.³ G08B *13/08, 13/02*

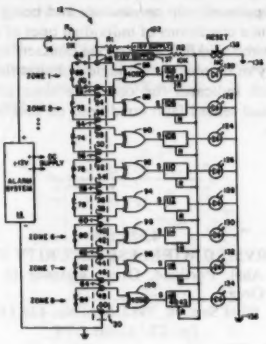
U.S. Cl. 340—524 **34 Claims**

1. An alarm system comprising:

a plurality of sensing means for detecting intrusion into a plurality of areas;

a plurality of zone indicating means, each being connected to a distinct one of said sensing means for indicating which

one of said sensing means has detected an intrusion, each of said zone indicating means being substantially identical;



each of said zone indicating means comprising an exclusive OR gate connected across one of said plurality of said sensing means.

4,523,186

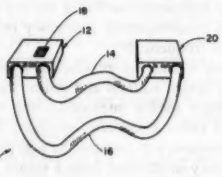
SEAL SYSTEM WITH INTEGRAL DETECTOR

Sidney Fiarman, Port Jefferson, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 12, 1982, Ser. No. 407,663

Int. Cl.³ G08B *13/18*

U.S. Cl. 340—555 **7 Claims**



1. A seal system comprising:

(a) a seal of the type wherein an optical signal is transmitted through a loop, comprising: a loop of fiber optics cable, closing said loop serving to secure an item to be sealed, and an optical detector to detect said transmitted signal so that attempts to open or tamper with said loop which cause alterations in said signal will be detected and will cause an observable change in the state of said seal;

(b) an environmental detector means for detecting changes in the local environment which might indicate an attempt to bypass the seal and tamper with the sealed item, said environmental detector means being operatively associated with said seal so that detection of such environmental change will also cause an observable change in the state of said seal;

(c) a first tamper-indicating housing, said housing containing circuitry for the transmission of an optical signal over said loop of fiber optics cable, for detection of a returned optical signal, and for provision of a unique observable change of state in response to a detected change in said returned signal;

(d) a second tamper-indicating housing, said second housing containing circuitry for detection and re-transmission of said optical signal and at least said environmental detector means for detecting changes in the local environment, said environmental detector means being operatively associated with said detection and re-transmission circuitry so that detection of an environmental change will change said re-transmitted signal.

4,523,187

ALARM SYSTEM FOR ELECTRIC FENCES

Geoffrey S. Begg, Heidelberg, Australia, assignor to Norman W. Hutchinson & Sons PTY. Ltd., South Melbourne, Australia

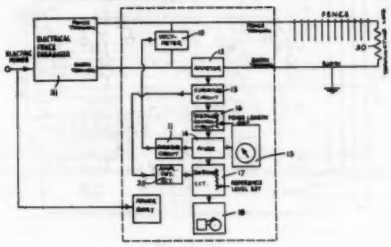
PCT No. PCT/AU81/00123, § 371 Date Apr. 20, 1982, § 102(e) Date Apr. 20, 1982, PCT Pub. No. WO82/00936, PCT Pub. Date Mar. 18, 1982

PCT Filed Jul. 27, 1981, Ser. No. 375,270

Claims priority, application Australia, Aug. 29, 1980, 5330/80

Int. Cl.³ H05C *3/00*; G08B *23/00*; G01R *19/00*

U.S. Cl. 340—661 **7 Claims**



1. A monitoring system for an electric fence having energizer means for applying an electric pulse of a certain magnitude to a long fence conductor near one end thereof, said long fence conductor forming the electric fence, and being adapted to cooperate with an indicating device, said long fence conductor having a remote end opposite said one end, said system comprising

a voltage sensor for sensing and measuring voltage on the conductor with respect to a voltage reference point,

a current sensor for sensing and measuring current flow in the conductor,

the values of voltage and current sensed being related to the magnitude of the electric pulse in the conductor, and being normally within a predetermined range of values,

a curvature circuit connected to said sensors for linearizing the measured voltage and current, and

a mixer circuit for receiving the linearized values of the voltage and the current, and for providing an output indicative of an apparent voltage level at the remote end of said long fence conductor,

said sensors, said curvature circuit, and said mixer circuit being located in proximity to said energizer means,

said indicating device being arranged

to receive and measure said output in the vicinity of said mixer circuit,

to provide from said output at any instant a measurement of said apparent voltage level at the remote end of said long fence conductor, and

to operate alarm means when said values fall outside said predetermined range of values.

4,523,188

AUTOMATED MAP AND DISPLAY ALIGNMENT

William A. Huber, Sea Girt, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

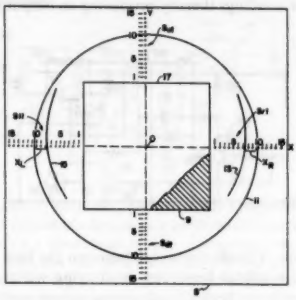
Filed Oct. 25, 1982, Ser. No. 436,249

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—734 **6 Claims**

1. Apparatus for automatically aligning an overlay map with an underlying electronic display, comprising, wide margins on said map on which are printed a circle concentric with the

map's center and in machine-readable ink, said margins also having printed in the same type of ink a pair of mirror-image spirals of Archimedes, four arrays of sensors capable of sensing said ink located along the extended x and y axes of said electronic display, said spirals being located in the vicinity of the positive and negative x-axes of said display, scanning means



adapted to scan said arrays of sensors to determine the intercepts of said circle and said spirals with said sensor arrays, circuit means for calculating the translational and rotational error of said map and said display from said intercepts, and further circuit means for shifting the position of said electronic display so that said map and display register with each other.

4,523,189

EL DISPLAY DEVICE

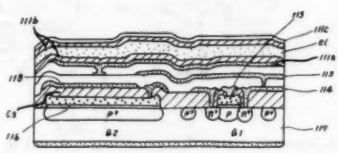
Kazuhiro Takahara, Kawasaki; Keizo Kurahashi, Sagamihara; Hiroyuki Gondo, Kobe; Kenichi Oki, Takarazuka, and Shoshin Miura, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 21, 1982, Ser. No. 380,698

Claims priority, application Japan, May 25, 1981, 56-80307; Feb. 23, 1982, 57-29634

Int. Cl.³ G09G *3/30*

U.S. Cl. 340—781 **8 Claims**



1. An EL display device having an EL layer having a luminous voltage level for activating an electroluminescent phosphor and a non-luminous voltage level and picture elements, formed on a semiconductor substrate, comprising:

a plurality of display electrodes, corresponding to the picture elements, arranged on the semiconductor substrate; and

switching transistors, formed on the semiconductor substrate and respectively, operatively connected to said plurality of display electrodes, for selectively driving the respective display electrodes corresponding to the picture elements, each of said switching transistors having a p-n junction with a breakdown voltage equal to a voltage difference between the luminous voltage level and non-luminous voltage level of the EL layer.

4,523,190

LOCAL EXCHANGE EQUIPMENT FOR A CABLE NETWORK

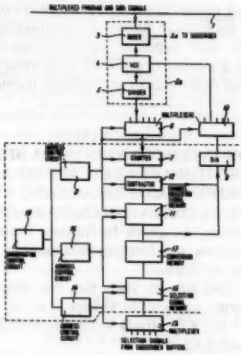
Minno De Roo, Delft, Netherlands, assignor to Deltakabel B.V., Netherlands

Filed Jul. 27, 1982, Ser. No. 402,280

Claims priority, application European Pat. Off., Apr. 29, 1982, 82200516.1

Int. Cl.³ H04Q *9/00*; H04N *7/16*

U.S. Cl. 340—825.03 **24 Claims**



1. Switching system comprising an exchange and a number of subscriber posts connected to said exchange through a cable network, whereby each subscriber post comprises selector means for generating selection signals for selecting one out of a number of program or data signals accomodated into channels received in the exchange over a multiplex line, and said exchange furthermore comprises for each subscriber post a mixing stage and a corresponding voltage controlled oscillator with a voltage memory, and furthermore comprises means for scanning the selection signals of the subscriber posts by means of a multiplexer, means for deriving a frequency signal, related to the nominal oscillator frequency, out of each selection signal, means for deriving a signal from the oscillator assigned to the corresponding subscribing post through a multiplexer and means for comparing said derived oscillator signal with said frequency signal related to the nominal oscillator frequency to generate a control signal for the voltage memory assigned to the measured oscillator which control signal is delivered thereto through a multiplexer for adjusting the oscillator such, that the program- or data signals chosen by means of the selection signals are transmitted from the exchange through the mixing stage and the cable network to the corresponding subscriber, characterized in that each of the subscriber posts comprises a buffer memory for storing selection signals and the exchange comprises means for distinguishing a new selection signal from an unaltered selection signal, a selection signal memory in which the new selection signals received from the buffer memories in the subscriber posts are stored, a conversion memory for deriving a digital channel indication signal out of a selection signal from the selection signal memory, a digital to analogue converter for converting said digital channel indication signal into a control signal for the related voltage memory, a frequency measuring unit for measuring each time the frequency of one of the voltage controlled oscillators, and a comparator for comparing the output signal of the frequency measuring unit with the corresponding digital channel indication signal and deriving a correction signal for the related voltage memory,

whereby in a first circuit the buffer memories in the subscriber posts are scanned in a predetermined sequence and the read out new selection signals are stored into the selection signal memory,

that in a second circuit which is in principle independent

from said first mentioned circuit each time one of the selection signals is read out from the selection signal memory and is converted by means of a conversion memory into the digital channel indication signal which is used to adjust the related voltage memory through the digital to analogue converter,

that in a third circuit in principle independent from said first and said second circuit the voltage controlled oscillators are scanned in a predetermined sequence and the frequencies thereof are measured by means of the frequency measuring unit, after which the value delivered by the frequency measuring unit is each time compared with the channel indication signal, corresponding to the related oscillator and supplied by the conversion memory, whereby a deviation between both results into a correction signal delivered to the voltage memory.

4,523,191

DEVICE FOR INTERCONNECTING A SERIES OF DATA ACQUISITION APPARATUSES TO A REMOTE RECEIVING AND RECORDING SYSTEM

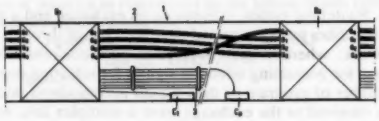
Jacques Cretin, Le Chesnay, and Claude Beauducel, Henouville, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Compagnie Generale de Geophysique, Massy, both of, France

Filed Jul. 30, 1982, Ser. No. 404,092

Claims priority, application France, Jul. 30, 1981, 81 15008

Int. Cl.³ H04Q *9/00*; G01V *1/22*

U.S. Cl. 340—825.52 **6 Claims**



1. An interconnection arrangement for connecting a series of data acquisition devices to a remote central receiving and recording system through a plurality of transmission cables, each device being operative for collecting signals generated by a particular set of signal generators and for transmitting said collected signals sequentially to said central receiving and recording system upon reception of a command control signal emanating from said system and transmitted to the data acquisition devices by said transmission cables, the data acquisition devices being interconnected by transmission cable sections of substantially equal length, and the series of data acquisition devices being subdivided into a plurality of groups, each group comprising the same number m of data acquisition devices, with the groups being consecutively arranged in the series, the respective single data acquisition devices of the same rank of each one of the groups being connected in parallel by a single transmission cable to the central receiving and recording system, and the data acquisition devices of different ranks in all the groups being connected by different transmission cables to the central receiving and recording system.

4,523,192

DATA PROCESSING NETWORK

Christopher P. Burton, Alderley Edge, and Kenneth C. Johnson, Cheadle, both of United Kingdom, assignors to International Computers Limited, London, England

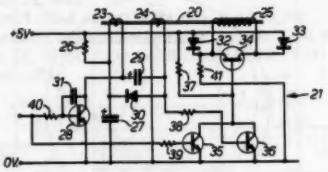
Filed Sep. 20, 1982, Ser. No. 420,272

Claims priority, application United Kingdom, Dec. 17, 1981, 8138099

Int. Cl.³ H04Q *9/00*; H04B *3/50*

U.S. Cl. 340—825.57 **4 Claims**

1. A data processing network comprising a plurality of data processing stations; a common bus for interconnecting the stations; and separate means for inductively separately coupling the stations to the bus, including a first magnetic core; first and second signal transmitter windings operatively coupled to the first core; a signal transmitter including first and second capacitors respectively in series with the first and second signal transmitter windings; means for charging the capacitor; first circuit paths between the first and second transmitter windings and the charging means; switching means for enabling the capacitors to be discharged through the respective transmitter windings thereby producing an output pulse on the



common bus; a diode connected between the first and second transmitter windings being non-conducting whilst the capacitors are being discharged; and second circuit paths including said diode between the capacitors and the associated transmitter winding wherein when the switching means is turned off, induced electromotive force in the first and second transmitter windings causes the diode to conduct thereby completing the second circuit paths to allow the capacitors to be charged by induced currents from the transmitter.

4,523,193

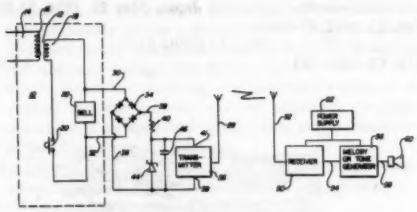
REMOTE-CONTROLLED DOORBELL SIGNAL RECEIVER

Samuel H. Levinson, 182 Maple Hill Rd., Glencoe, Ill. 60022, and Jack R. Caldicott, 28461 W. Kelsey Ct., Barrington, Ill. 60010

Filed Nov. 21, 1983, Ser. No. 553,974

Int. Cl.³ H04Q *9/00*; H04B *1/00*; G08B *27/00*

U.S. Cl. 340—825.69 **9 Claims**



1. A doorbell system for providing a sound in a selected location having a wired doorbell system, in response to the actuation of an existing doorbell switch that is positioned adjacent to a door, which comprises:

a transmitter for generating an over-the-air radio signal;

means for actuating said transmitter when the doorbell switch is operated;

said actuating means comprising means for coupling the transmitter across the existing bell of the existing wired doorbell, and rectifier means for rectifying the alternating current in the existing doorbell and providing direct current to the transmitter;

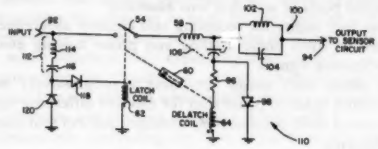
a remote receiver for receiving said radio signal and for providing a predetermined output in response to receipt of said radio signal; and

sound producing means coupled to the output of said remote receiver for providing a sound in response to said predetermined output from said remote receiver.

4,523,194
REMOTELY OPERATED DOWNHOLE SWITCHING APPARATUS

Robert L. Hyde, Bartlesville, Okla., assignor to TRW, Inc., Cleveland, Ohio

Filed Oct. 23, 1981, Ser. No. 314,665
Int. Cl.³ E21B *47/00, 47/06*
U.S. Cl. 340—856 **17 Claims**

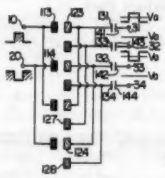


4. A downhole switching apparatus for controlling the connection of a downhole device to a cable which carries energizing current to a downhole motor, comprising switch means connected between the downhole device and the cable, the switch means having a closed position at which the downhole device is connected to the cable and having an open position at which the downhole device is disconnected from the cable, latching means responsive to a latching signal carried by the cable for closing the switch means, delatching means responsive to current flow of a predetermined direction therethrough for opening the switch means, frequency responsive means responsive to a delatching signal carried by the cable and capable of passing to the delatching means a current in said predetermined direction and a current in the opposite direction, and means connected to the delatching means for preventing current in said opposite direction from passing through the delatching means, wherein the latching means and the delatching means comprise a latch and a delatch coil, respectively, wherein the preventing means comprises a diode, wherein the delatching means further comprises a resistor connected in series with the delatch coil, and the diode is connected in parallel with the resistor and the delatch coil.

4,523,195
ROTATIONAL DIRECTION AND ANGLE DETECTING APPARATUS

Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 3, 1982, Ser. No. 354,433
Claims priority, application Japan, Mar. 9, 1981, 56-33585
Int. Cl.³ G08C *19/10*
U.S. Cl. 340—870.37 **9 Claims**



1. A rotation detecting apparatus comprising:

a fixed first circular plate having a plurality of first and second input electrodes alternately arranged at equal spatial invervals along the circumference of said first plate;

a rotatable second circular plate facing said first plate so that a plurality of third output electrodes arranged at equal spatial intervals along the circumference of said second plate are in opposed relation with said first and second input electrodes of said first plate at one rotational position of said second plate, and so that a plurality of fourth output electrodes arranged at equal spatial intervals along the circumference of said second plate are adapted to be in opposed relation with said first and second input electrodes when said second plate is rotated such that said third output electrodes are not in opposed relation which said first and second input electrodes of said first plate;

periodic signal supply circuit means for supplying signals of a predetermined period and opposite alternating phase to said first and second input electrodes, respectively, of said first plate, said signals inducing signals in said third and fourth electrodes when they are positioned opposite said first and second electrodes;

induced signal transmission means for transmitting said signals induced in said third and fourth electrodes from said second plate to said first plate;

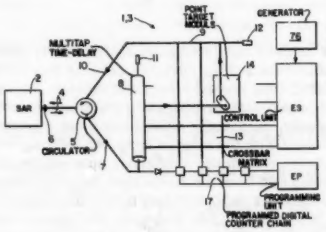
first and second rotation signal generator circuit means for detecting the phases of said signals induced in said third and fourth output electrodes and comparing said detected phases with the phase of said signals supplied by said periodic signal supply circuit means to thereby produce first and second rotation signals; and

rotation output circuit means for producing, in response to said first and second rotation signals, a signal indicating the direction of rotation of said second plate and for indicating the angle of said rotation.

4,523,196
TEST EQUIPMENT FOR A SYNTHETIC APERTURE RADAR SYSTEM

Wolfgang Gieraths, Friedrichshafen, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,687
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112112
Int. Cl.³ G01S *7/40*
U.S. Cl. 343—17.7 **15 Claims**



1. Test equipment, for a synthetic aperture radar (SAR) system having input/output terminals normally connected to an antenna, the antenna being disconnected from the terminals during a test, the test equipment provided for generating a selectible test pattern for simulating various targets, comprising, an input circuit connected to the terminals for receiving pulses or signals emitted by the SAR system in the absence of a SAR antenna, and for returning simulated response signals to the SAR system, and including a circulator for combining incoming and outgoing pulses or signals of the SAR system;

a signal loop connected to the input circuit and being composed of a forward branch and a return branch combined at said circulator, the forward branch including means for reproducing the varying travel times of the pulses or signals issued by the SAR system comprising of a multitap time-delay, thereby providing a plurality of differently delayed signals, said return branch including a bus for combining delayed pulses or signals;

the loop further including a crossbar matrix, having input lines connected respectively to the taps of said multitap delay and having output lines, seperated from the input

lines but defining cross-points therewith and being connected to said bus of said return branching;

the matrix further including target module means operating as point target modulators, for selectively interconnecting an input line with an output line of said matrix at a cross-point thereof, so that a loop is established through the forward and return branches and at least one target module at the matrix crosspoint;

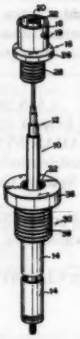
said two branches being terminated at their ends by their characteristic impedances.

4,523,197

ANTENNA WITH BNC-TYPE COAXIAL CONNECTOR

Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,892
Int. Cl.³ H01Q *1/50*
U.S. Cl. 343—702 **5 Claims**



1. An antenna comprising: an antenna body telescopically extendable from a fully retracted position and having a free end; a BNC-type coaxial receptacle member mounted to the free end of said antenna body, said receptacle member including a tubular, electrically conductive inner electrode electrically coupled with the antenna body and defining an axial bore and a tubular, electrically conductive outer electrode coaxially surrounding said inner electrode; base means for mounting said antenna body to a radio, said base means including a cylindrical portion for telescopically mounting said antenna body and a receptacle portion for receiving said outer electrode member when the antenna body is in said fully retracted position; said outer electrode and said receptacle portion of said base means being in electrically conductive contact when said antenna body is in said fully retracted position so as to electrically ground said outer electrode.

4,523,198

RADIO FREQUENCY LENS ANTENNA

Roger E. Clapp, Cambridge, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 7, 1983, Ser. No. 511,697
Int. Cl.³ H01Q *19/06*
U.S. Cl. 343—754 **4 Claims**

1. An R-2R lens antenna system comprising:

first, second and third lens assemblies,

each of said lens assemblies comprising a pair of R-2R lenses each having N signal transfer ports, where N is a number, disposed about the circular periphery thereof,

each of said lens assemblies further comprising N ninety degree hybrid couplers each having an element signal port, a beam signal port, and a pair of phase-related signal ports, said phase-related signal ports being connected to like-positioned signal transfer ports in said pair of R-2R lenses,

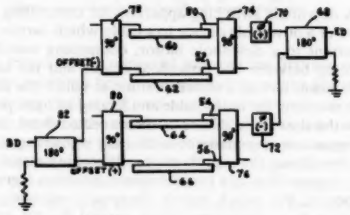
a plurality of antenna elements arranged in a circular array,

first coupler means for combining diametrically-opposed pairs of said antenna elements to form element sum and element difference signals,

means for coupling said element sum signals to element signal ports of said first lens assembly,

phase shift means for receiving said element difference signals to form phase leading and phase lagging element difference signals,

said phase shift means providing a progressively incremented value of phase shift for element difference signals derived from progressively arranged pairs of said antenna elements,



means for coupling said phase leading element difference signals to the element signal port of said second lens assembly,

means for coupling said phase lagging element difference signals to the element signal port of said third lens assembly,

second coupler means coupled to the beam signal ports of said second and said third lens assembly to provide a composite beam difference signal, and

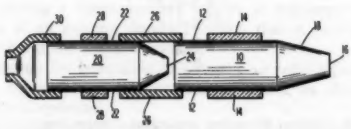
third coupler means coupled to the beam signal port of said first lens assembly and receiving the composite beam difference signal from said second coupler means to provide beam signals for diametrically-opposed beam directions.

4,523,199

HIGH STABILITY DEMAND INK JET APPARATUS AND METHOD OF OPERATING SAME

Robert J. Ott, Newtown, Conn., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 29, 1982, Ser. No. 428,427
Int. Cl.³ G01D *9/00, 15/16*
U.S. Cl. 346—1.1 **10 Claims**



1. An ink jet apparatus comprising:

an ink jet chamber including a droplet ejection orifice and an ink supply inlet;

a supply channel coupled to said inlet for supplying ink thereto;

restrictor means between said inlet and said channel so as to substantially preclude flow of ink from said chamber to said channel;

transducer means coupled to said chamber for expanding

and contracting said chamber so as to eject a droplet of ink on demand as the chamber contracts; and

said transducer means also coupled to said supply channel for contracting said chamber as said channel expands and expanding said supply channel as said chamber contracts.

8. A method of operating an ink jet apparatus comprising an ink chamber including a droplet ejection orifice, an ink supply inlet and a supply channel coupled to said inlet for supplying ink thereto, said method comprising the following steps:

expanding the chamber so as to fill the chamber with ink;

contracting the channel so as to assist in filling the chamber while simultaneously expanding the chamber;

contracting the chamber so as to eject a droplet of ink;

expanding the channel while simultaneously contracting the chamber and ejecting a droplet of ink; and

substantially precluding the flow of ink from said chamber to said supply channel.

4,523,200

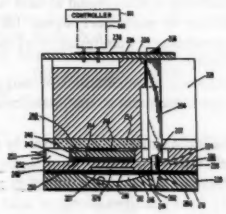
METHOD FOR OPERATING AN INK JET APPARATUS

Stuart D. Howkins, Ridgefield, Conn., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 27, 1982, Ser. No. 453,571

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—1.1 **6 Claims**



1. A method for driving an ink jet head with a composite waveform including independent successive first and second electrical pulses for ejecting an ink droplet of controlled volume to print at droplet velocities ranging from 3.5 meters per second to in excess of 50.0 meters per second, said method further providing stabilized operation of said ink jet head for both producing high-velocity ink droplets substantially free of "satellite droplets", and substantially eliminating the formation of "puddles of ink" about an associated orifice of said ink jet head, said method comprising:

(1) constructing said first electrical pulse to have an amplitude greater than said second electrical pulse, whereby termination of said first electrical pulse causes rapid volume reduction of an associated ink chamber of said ink jet head, for initiating the ejection of an ink droplet from said associated orifice;

(2) constructing said first electrical pulse to have a pulse width substantially greater than that of said second electrical pulse, whereby application of said second electrical pulse causes rapid volume expansion of said associated ink chamber for causing earlier break off of said ink droplet from said associated orifice relative to only using first electrical pulse; and

(3) controlling the volume of said ink droplet(s) via adjustment of either one or a combination of the ratios of the amplitudes and pulse widths of said first to said second pulses, and the time period between the termination of said first pulse and initiation of said second pulse.

4,523,201

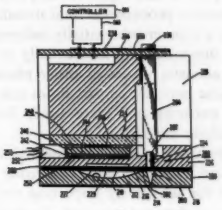
METHOD FOR IMPROVING LOW-VELOCITY AIMING IN OPERATING AN INK JET APPARATUS

Stephen J. Liker, Danbury, Conn., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 27, 1982, Ser. No. 453,293

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—1.1 **8 Claims**



1. A method for driving an ink jet head with a composite waveform including independent successive first and second electrical pulses for ejecting an ink droplet to print with improved droplet aim accuracy at droplet velocities less than 3.5 meters per second, said method further comprising:

constructing said second electrical pulse with a pulse width substantially shorter than the pulse width of said first electrical pulse; and

further constructing said second electrical pulse to have an amplitude not greater than the amplitude of said first electrical pulse, whereby termination of said first electrical pulse causes rapid volume reduction of an associated ink chamber of said ink jet head, thereby initiating the ejection of an ink droplet from an associated orifice of said ink chamber, followed by initiation of said second electrical pulse for rapidly expanding the volume of said ink chamber, for causing said droplet to break-off earlier from the center of said associated orifice relative to the time and location of break-off in the absence of said second electrical pulse.

4,523,202

RANDOM DROPLET LIQUID JET APPARATUS AND PROCESS

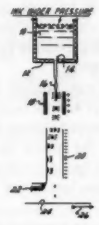
Rodger L. Gamblin, Dayton, Ohio, assignor to Burlington Industries, Inc., Greensboro, N.C.

PCT No. PCT/US82/00140, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02767, PCT Pub. Date Aug. 19, 1982

Continuation-in-part of Ser. No. 231,326, Feb. 4, 1981, abandoned. This PCT application Feb. 3, 1982, Ser. No. 428,490

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **12 Claims**



1. Apparatus for randomly generating liquid droplets and for selectively applying such liquid droplets to a moving substrate surface, said apparatus comprising:

a source of pressurized liquid;

an array of spaced apart liquid jet orifices extending in a cross-machine direction transverse to the direction of movement of said substrate surface, each of said orifices being in fluid communication with said source of pressurized fluid;

random signal generation means including a random signal generator driving an electro-acoustic transducer acoustically coupled to said liquid for actively inducing random drop formation processes in fluid streams issuing from said orifices in a manner substantially independent of the cross-machine dimension by substantially avoiding stationary standing acoustic waves or other phenomena associated with regular periodic perturbations that would, if regular periodic perturbations were used, limit the maximum cross-machine dimension;

charging electrode means disposed downstream of said orifices and extending over the zone of random drop formation for selectively imparting electrical charges to said drops as they are randomly formed; and

deflection electrode means disposed downstream of said charging electrode means for deflecting electrically charged droplets away from the substrate surface.

4,523,203

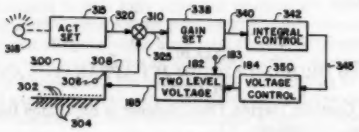
GREY SCALE THERMAL PRINTER CONTROL SYSTEM

William M. Adkisson, and Richard W. Adkisson, both of Englewood, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 7, 1984, Ser. No. 607,984

Int. Cl.³ B41J *1/24*

U.S. Cl. 346—76 PH **20 Claims**



1. In a thermal recording system having a succession of control cycles each containing a "write" portion and a "no write" portion, the system including a thermal recording heater, a first power source, and a second power source of magnitude less than the first power source, the first power source operable to energize the heater, during the "write" portion of a control cycle to increase the temperature of the heater to at least a first value that produces a melt in a thermally responsive recording medium positioned near the heater, the improvement comprising:

control means operable to control the time interval during which the first power source energizes the heater so as to produce a predetermined size of the melt and to interrupt the energization of the heater by the first power source thereafter so that the heater cools to a low value below the first value during the "no write" portion of the control cycle, and

further means operable to energize the heater by the second power source during the "no write" portion of the control cycle to raise the temperature of the heater to a predetermined value below the first value prior to the "write" portion of the next control cycle.

4,523,204

METHOD AND APPARATUS FOR TIMING RACES

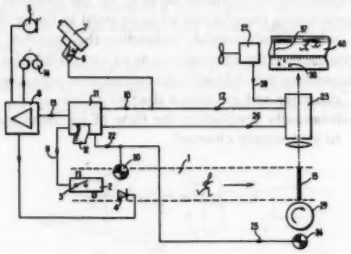
Jean-Pierre Bovay, Bienne, Switzerland, assignor to SSIH Equipment S.A., Bienne, Switzerland

Continuation of Ser. No. 334,012, Dec. 23, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 597,566

Claims priority, application France, Dec. 31, 1980, 80 27958

Int. Cl.³ G01D *9/24*

U.S. Cl. 346—107 B **5 Claims**



1. A system for recording on a single document indications of first events occuring at the start of a race at a start line and second events occuring at the end of a race at a finish line, said system comprising:

a camera positioned at a fixed position at the finish line;

means for producing a start signal at said start line;

means responsive to said start signal for simultaneously therewith producing a manifestation of said start signal at said finish line;

means for producing manifestations of said second events at said finish line subsequent to said manifestation of said first event;

said camera including means for separately recording at the time of their occurrence and on a single document first said manifestation of said start signal as a first event and subsequently said manifestations of said second events; and,

means for generating within the field of view of said camera a luminous indication for each race participant indicating the instant at which each race participant leaves said start line.

4,523,205

HEAT-SENSITIVE RECORDING MATERIALS

Toshitake Suzuki, Hyogo; Ryuzo Hayashi; Naoto Arai, both of Osaka, and Yoshitaka Oeda, Nara, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

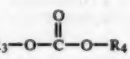
Filed Nov. 18, 1983, Ser. No. 552,919

Claims priority, application Japan, Nov. 30, 1982, 57-210057; Aug. 4, 1983, 58-144277

Int. Cl.³ B41M *5/18*

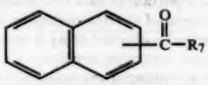
U.S. Cl. 346—208 **5 Claims**

1. A heat-sensitive recording material comprising a support having formed thereon a heat-sensitive layer comprising a colorless or pale-colored basic dye and a color developing material that, when heated, reacts with the basic dye to form a color, wherein said heat-sensitive recording layer further comprises at least one heat-fusible material having a melting point in the range of 70° C. to 140° C. and selected from the compounds represented by following formulae (II), (IV), (V):

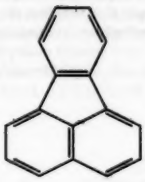


(II)

-continued



(IV)



(V)

wherein R_7 independently represents a phenyl group, a benzyl group, or a tolyl group, each of which groups may be substituted with a halogen atom; and R_3 and R_4 independently represent an aryl group or an aralkyl group, each of which groups may be substituted with an alkyl group, an aralkyl group, a halogen atom, a hydroxy group, an alkoxy group, an aryloxy group, an alkylcarbonyloxy group, an arylcarbonyloxy group, an alkoxycarbonyl group, or an aryloxycarbonyl group.

4,523,206

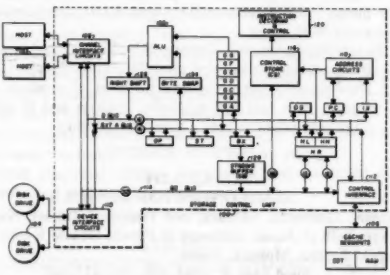
CACHE/DISK SYSTEM WITH WRITEBACK REGULATION RELATIVE TO USE OF CACHE MEMORY

Lawrence D. Sasscer, Santa Clara, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,327

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **11 Claims**



1. In a cache/disk system having a host processor for issuing read and write commands, a plurality of disk drive devices, a cache memory for storing segments of data most likely to be used in executing commands from said host processor, storage means for storing in a queue commands issued by said host processor but not yet executed, each of said commands including a priority value for determining the relative priorities of execution of said queued commands and a storage control unit for controlling the transfer of segments of data between said cache memory and said disk drive devices, said storage control unit having means for generating a command for controlling the transfer of a written-to segment from said cache memory of one of said disk drive devices, the improvement comprising:

first means for generating a written-to priority value in accordance with the percentage of the total number of segments in said cache memory that have been written to; and,

second means responsive to said first means for inserting said written-to priority value into the command generated for transferring a given written-to segment to one of said disk drive devices.

4,523,207

MULTIPLE COPY THERMAL RECORD SHEET

Maurice W. Lewis, Dayton, and Stephen D. Lukes, West Carrollton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 30, 1983, Ser. No. 480,518

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—214 **10 Claims**

1. A thermal-sensitive sheet copy system for use with at least one thermal printing element for initiating an image and forming a copy thereof, said copy system comprising a

first sheet having a coating on the back thereof, and a

second sheet rearward of and in contact with the coating on the first sheet, said coating including crystal violet lactone thermochromic dye of about 5–7% by weight, a wax of about 26–30% by weight and 4,4′ isopropylidenediphenol phenolic resin of about 26–30% by weight mixed in a binding of about 10% polyterpene resin material wherein the image initiated by the thermal printing element is the coating on the first sheet becomes tacky when heated at low energy levels and causes transfer and adherence of a portion of the coating of the initiated image to the second sheet thereby producing a multiple-copy image during a printing operation.

4,523,208

HEAT-SENSITIVE RECORDING MATERIAL

Helmut Barzynski, Bad Durkheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,326

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243945

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—214 **9 Claims**

1. A heat-sensitive recording material which comprises a heat-sensitive layer which is applied onto a base and contains a color-producing substance, which is usually colorless or only slightly colored, and an activator which, under the action of heat, causes the color-producing substance to produce a coloration, wherein the activator is a sulfonic acid ester.

4,523,209

APPARATUS FOR THE MANUFACTURE OF PROFILE SEGMENTS

Jan H. Popken, Assen, Netherlands, assignor to Popken Metaal B.V., Assen, Netherlands

Filed Dec. 3, 1982, Ser. No. 446,828

Claims priority, application Netherlands, Dec. 10, 1981, 8105561

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—469 **5 Claims**

1. An apparatus for the continuous manufacture, from metal or plastic strip material, of profile segments, cut to size and possibly perforated, and having a one-sided or two-side profile, comprising a strip supply, a strip guiding path with at least one profile rolling unit, a driving motor for driving transport rolls of the strip guiding path and the rolling unit, and a periodically activatable cutting means, the apparatus comprising:

at least one first profile rolling unit for profiling the one lateral side of the strip supplied, and at least one second

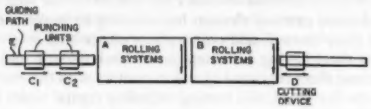
profile rolling unit for profiling the other lateral side of the strip profiled unilaterally by the first profile rolling unit, said first and second profile rolling units being adjustable transversely to the strip passage direction,

at least one periodically activatable perforating unit for making a desired perforation pattern in the strip, said perforation unit being mounted on a carriage, which can be mounted in a detachable way before, between or behind the rolling units, and

a periodically activatable cutting means, also mounted on a detachable carriage,

as well as an electronic control system comprising:

a pulse generator, of which the pulse frequency is tuned to the passage rate of the strip, a pulse counter, a plurality of selectable counting storages, one for each perforating unit and one for the cutting means, each counting storage having fixed counting contents, which correspond with the time for initiating operation of the respective perforating unit or cutting means concerned,



a process unit, which compares the count of the pulse counter with the counting contents of the selected counting storages and, if equal values are found, issues a trigger signal for the activation of the perforating unit or cutting means concerned, and resets the counter at the end of a counting cycle,

programming means for setting the counting storages and for the transverse adjustment of the first and second profile rolling units, and for setting the production number,

means comprising supervision logic for supervising the material, the material supply, the machine functions, the settings and the production counting,

a control panel and a means for adjusting the timing of said initial operation of said cutting means and perforating unit associated with each of said cutting means and perforating units, said means individually adjusting said timing to account for the inertia of said cutting means and perforating unit, respectively, so that the size of said segments and the spacing between any perforations therein are independent of the inertia of said cutting means and perforating unit.

4,523,210

FAST ERROR CHECKED MULTIBIT MULTIPLIER

Glen R. Kregness, Minnetonka, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,644
Int. Cl.³ G06F *7/52*
U.S. Cl. 364—760 **3 Claims**

1. A fast, error checked multibit multiplier to provide increased performance for the multiply operations of a large scale data processor by processing a plurality of bits per machine cycle comprising:

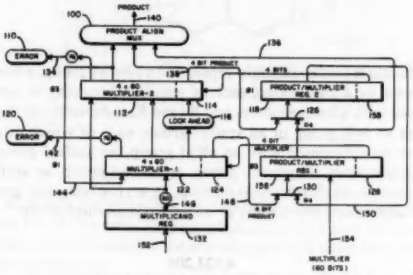
(a) a multiplicand register connected to receive the multiplicand;

(b) a first and a second multiplier array each connected to said multiplicand register to receive therefrom the contents of said multiplicand register; said first and second multiplier arrays being further iteratively interconnected such that the output of the second multiplier array is connected to the input of the first array;

(c) a first and a second multiplier register iteratively interconnected such that the output of said first multiplier register is connected to the input of the second and the output of the second is connected to the input of the first;

(d) said first and second multiplier arrays and said first and second multiplier registers further interconnected one to another such that a portion of said first multiplier array is connected to the input of the first multiplier register and a portion of said second multiplier array is connected to the input of said second multiplier register,

(e) a multiple phase activating source connected to said first and second multiplier arrays and to said first and second multiplier registers such that said first multiplier array and said second multiplier register are simultaneously actuated during one phase and said second multiplier array and said first multiplier register are simultaneously actuated during another;



(f) a first multiplier control means connected between said first multiplier array and said first multiplier register such that a portion of the output of the first multiplier register is used to control said first multiplier array;

(g) a second multiplier control means connected between said second multiplier array and said second multiplier register such that a portion of the output of said second multiplier register is used to control said second multiplier array; and

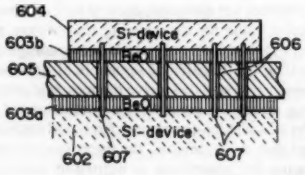
(h) a multiplexing and aligning means connected to sequentially receive portions of product output signals from said second multiplier array and portions of product output signals from said first multiplier register and to properly align said portions into a complete product.

4,523,211

SEMICONDUCTOR DEVICE

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaokakyo, both of Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Mar. 8, 1983, Ser. No. 473,243
Claims priority, application Japan, Mar. 16, 1982, 57-40309
Int. Cl.³ H01L *27/12*
U.S. Cl. 357—4 **17 Claims**



1. A semiconductor device comprising:

a lower semiconductor layer;

an electrical insulating layer made of a crystalline beryllium oxide thin film, said electrical insulating layer being deposited on said lower semiconductor layer; and

an upper semiconductor layer, said upper semiconductor

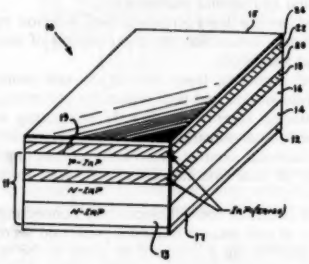
layer being grown on said electrical insulating layer to be regulated by the crystalline structure of beryllium oxide thin film.

4,523,212

SIMULTANEOUS DOPED LAYERS FOR SEMICONDUCTOR DEVICES

Frank Z. Hawrylo, Trenton, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 12, 1982, Ser. No. 357,441
Int. Cl.³ H01L *33/00, 27/14, 29/167, 23/48*
U.S. Cl. 357—17 **2 Claims**



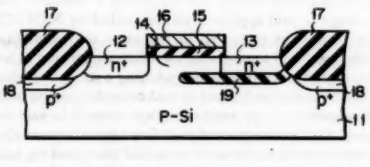
1. A semiconductor device comprising:
a solid having a plurality of semiconductor layers and a substrate, said semiconductor layers being formed upon said substrate, said layers being composed of indium phosphide;
at least one ohmic capping layer formed on an outer surface of said solid, said capping layer comprised of indium phosphide, and both a group II element, and a group VI element, said capping layer being formed of material comprising indium phosphide, zinc, and selenium having been formed from a growth solution in amounts of about 99.6199% indium, 0.1762% phosphorous, 0.1801% selenium and 0.0238% zinc by weight;
a first electrical contact on said capping layer for connecting said semiconductor device into a circuit; and
a second electrical contact formed on said substrate for connecting said device into a circuit.

4,523,213

MOS SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Masami Konaka, Kawasaki; Hiroshi Iwai, Tokyo, and Yoshio Nishi, Yokohama, all of Japan, assignors to VLSI Technology Research Association, Tokyo, Japan

Continuation of Ser. No. 144,837, Apr. 29, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,843
Claims priority, application Japan, May 8, 1979, 54-55870
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23.7 **8 Claims**



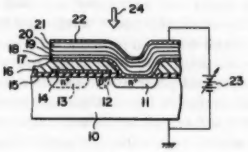
1. An MOS semiconductor device, which comprises:
a semiconductor substrate of a first conductivity type;
a source region of a second conductivity type, said source region being formed in said semiconductor substrate;
a drain region of a second conductivity type, said drain region being formed in said semiconductor substrate;
a short channel region disposed between said source and drain regions;
a gate electrode deposited on the channel region through a gate insulation layer; and
a buried solid insulating region formed in said substrate over at least a part of a bottom plane of the channel region wherein said channel region is integrally coupled with said semiconductor substrate.

4,523,214

SOLID STATE IMAGE PICKUP DEVICE UTILIZING MICROCRYSTALLINE AND AMORPHOUS SILICON

Masataka Hirose, Hiroshima; Kazuhiro Kawajiri, Asaka, and Yosuke Nakajima, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 2, 1982, Ser. No. 394,499
Claims priority, application Japan, Jul. 3, 1981, 56-104885; Jul. 3, 1981, 56-104886; Jul. 3, 1981, 56-104887
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **8 Claims**



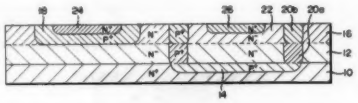
1. A solid state image pickup essentially consisting of a semiconductor substrate provided with light detecting sections and a scanning means for sequentially selecting the signals detected by said light detecting sections, each light detecting section contains a first silicon layer in which microcrystalline silicon and amorphous silicon are uniformly distributed and the crystal structure of said first silicon layer varies substantially continuously throughout.

4,523,215

SEMICONDUCTOR DEVICE

Shiro Iwatani, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1981, Ser. No. 227,784
Claims priority, application Japan, Jan. 21, 1980, 55-6558
Int. Cl.³ H01L *27/02, 27/04, 29/72*
U.S. Cl. 357—40 **1 Claim**



1. A semiconductor device comprising: a low resistivity semiconductor substrate of a first type of conductivity; a first high resistivity semiconductor layer of said first type of conductivity which is disposed on an entire surface of said semiconductor substrate; a buried low resistivity anode layer of a second type of conductivity which is disposed on a predetermined portion of a boundary between said semiconductor substrate and said first high resistivity semiconductor layer; a first anode wall in the form of an annulus extending through said first high resistivity semiconductor layer from a surface thereof which is remote from said semiconductor substrate and

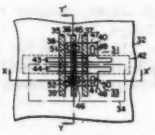
reaching a peripheral portion of said buried anode layer, said first anode wall being of said second type of conductivity and having a low resistivity; a second high resistivity semiconductor layer of said first type of conductivity which is disposed on an entire surface of said first high resistivity semiconductor layer including said first anode wall; a second anode wall in the form of an annulus extending through said second high resistivity semiconductor layer from a surface thereof which is remote from said first high resistivity semiconductor layer and reaching said first anode wall, said second anode wall being of said second type of conductivity and having a low resistivity; a low resistivity base layer of said second type of conductivity which is selectively disposed on an exposed surface of said second high resistivity semiconductor layer and reaching said first high resistivity semiconductor layer at a position which is located outside of said annulus of said second anode wall on said second high resistivity semiconductor layer so as to be spaced therefrom; a low resistivity cathode layer of said first type of conductivity which is selectively disposed on an exposed surface of a portion of said second high resistivity semiconductor layer which is encircled by said second anode wall; and a low resistivity emitter layer of said first type of conductivity which is selectively disposed on a surface of said base layer; wherein a power transistor is formed with said emitter layer as an emitter, said base layer used as a base and both a portion of said first high resistivity semiconductor layer located directly under said base layer and said semiconductor substrate used as a collector and wherein a power semiconductor diode is formed with said buried anode layer and said first and second anode walls used as an anode and said low resistivity cathode layer and portions of said first and second high resistivity semiconductor layers which are respectively encircled by said first and second anode walls used as a cathode and wherein said second high resistivity layer of said first type of conductivity is thicker than said first high resistivity semiconductor layer of said first type of conductivity.

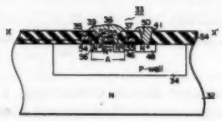
4,523,216

CMOS DEVICE WITH HIGH DENSITY WIRING LAYOUT

Yoshihisa Shiotari, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 2, 1982, Ser. No. 354,034
Claims priority, application Japan, Apr. 24, 1981, 56-62229
Int. Cl.³ H01L *23/48, 29/04, 27/02*
U.S. Cl. 357—42 **2 Claims**





1. A CMOS device comprising:

a semiconductor substrate of a first conductivity type;

a first transistor having a source region and a drain region of a second conductivity type formed in said semiconductor substrate spaced apart from one another, and having an insulation gate layer formed over said substrate between said source and drain regions;

a well region of said second conductivity type provided in said semiconductor substrate;

a second transistor having a source region and a drain region of said first conductivity type formed in said well region spaced apart from one another and having an insulation gate layer formed over said well region between said source and drain regions and extending to said insulation gate layer of said first transistor to thereby form a first insulation layer, said source and drain regions of said first and second transistors being separated from one another by a portion of said substrate and by a portion of said well region which forms an isolation region between said transistors;

a first wiring layer positioned on said first insulating layer to cross said isolation region and to form gate electrodes of said first and second transistors;

a second wiring layer crossing said isolation region and electrically connected the drain regions of said first and second transistors;

a second insulating layer formed on said semiconductor substrate and on said well region for preventing said second wiring layer from directly contacting either said semiconductor substrate or said well region;

a first electrical contact electrically connecting the drain region of said first transistor with said second wiring layer;

a second electrical contact electrically connecting the drain region of said second transistor with said second wiring layer and having a structure the same as the structure of said first electrical contact;

a third insulating layer disposed over at least those portions of said first and second wiring layers which are located over said isolation region; and

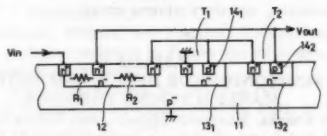
a power source wiring layer disposed over said isolation region so as to cross said first and second wiring layers at right angles.

4,523,217

SOLAR POWERED CIRCUIT HAVING CMOS AND BIPOLAR TRANSISTORS

Mitsuo Jibu, Ueno, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1983, Ser. No. 495,253
Claims priority, application Japan, May 31, 1982, 57-93425
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—43 **2 Claims**



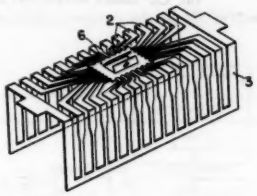
1. A circuit powered by a solar cell for use in an electronic appliance comprising:

appliance control circuit means including a first conductivity type semiconductor substrate having p and n channel complementary MOS transistors; and constant voltage control circuit means for supplying a constant reference voltage to said appliance circuit including N ($N \geqq 2$) bipolar transistors provided in the same said semiconductor substrate, said semiconductor substrate serving as a collector region, each transistor including a second conductivity type base region formed in said collector region and a first conductivity type emitter region formed in said base region, the base region of said first bipolar transistor being connected to a reference potential provided by said solar cell, the base regions of i-th ($i \leqq N$) bipolar transistors being connected to the emitter regions of $(i-1)$-th bipolar transistors.

4,523,218
LEAD FRAME FOR INTEGRATED CIRCUITS AND METHOD OF FABRICATING THE SAME

Yoshihisa Kato, Kokubunji, Japan, assignor to Sumitomo Metal Mining Company, Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 425,102
Claims priority, application Japan, Sep. 29, 1981, 56-154653
Int. Cl.³ H01L *23/48, 23/04*
U.S. Cl. 357—70 **11 Claims**



1. A lead frame for use in an integrated circuits package, comprising:

a multiplicity of spaced leads extending outwardly from a central opening and having inner and outer ends;

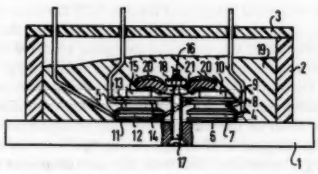
a support frame integrally supporting said outer ends of said leads; and

a metal piece disposed in said central opening and having in peripheral edges thereof alternate recesses and projections, said recesses fitting over and receiving said inner ends and said projections fitting in gaps between said inner ends, said metal piece also having slots spaced inwardly from said recesses and projections and cut-outs defined between said slots, said slots and said cut-outs jointly dividing said metal piece into a plurality of comb-shaped members interconnected by a plurality of bendable portions defined therebetween by said slots and said cut-outs, said comb-shaped members being independently bendable.

4,523,219
SEMICONDUCTOR COMPONENT WITH PRESSURE CONTACT

Peter Heidegger, and Jakob Kiefer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,556
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232168
Int. Cl.³ H01L *23/42, 23/44, 23/46*
U.S. Cl. 357—79 **4 Claims**

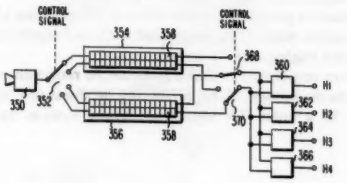


1. Semiconductor component, comprising a case having a metal bottom, at least one semiconductor body disposed in said case and having first and second principal surfaces, said first principal surface being in at least thermal contact with said metal bottom, at least one lead electrode in contact with said second principal surface, a spring anchored in said metal bottom and pressing said metal bottom, semiconductor body and lead electrode together into contact with each other, casting compound at least partially filling said case and contacting given surfaces of said spring seating said spring in said casting compound, and a permanently elastic synthetic resin mass at least partially coating said given surfaces of said spring being in contact with said casting compound.

4,523,220
COMPATIBLE HIGH-DEFINITION TELEVISION SYSTEM UTILIZING HADAMARD BASIS FUNCTIONS

Edward H. Adelsen, Plainsboro, and Charles B. Oakley, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 19, 1983, Ser. No. 459,334
Int. Cl.³ H04N *5/38, 5/46*
U.S. Cl. 358—12 **19 Claims**



1. A high-definition television system for generating a high-definition television signal compatible with a standard-definition television receiver arranged to normally process a lower-definition television signal conforming to a given broadcast standard having a limited-bandwidth, said system comprising:

scanning means for scanning an image to provide a high definition image signal, the effective line scan rate of said image signal being greater than the line rate of said given broadcast standard;

quantizing means for time quantizing samples of said image signal to provide a sampled signal having a given sample rate;

Hadamard means responsive to said sampled signal for transforming at least three of said time quantized samples formed in a polygonal fashion into a plurality of coefficients representative of the coefficients of Hadamard basis functions, one of said plurality of coefficients being the sum of said samples formed in said polygonal fashion; and wherein

said effective line rate of said scanning means and said given sample rate of said quantizing means are each selected with respect to said given broadcast standard such that said one of said plurality of coefficients of said Hadamard basis function corresponds to a picture element in said given broadcast standard; and

means for limiting the bandwidth of said one of said plurality of coefficients provided by said Hadamard means to said bandwidth of said given broadcast standard to thereby provide said high-definition television signal having an effective line rate and bandwidth compatible with said standard-definition television receiver.

4,523,221
TV RECEIVER CIRCUITRY FOR PERFORMING CHROMA GAIN, AUTO-FLESH CONTROL AND THE MATRIXING OF I AND Q SIGNALS TO (R-Y), (B-Y) AND (G-Y) SIGNALS

Danny Chin, Plainsboro; Eric P. Batterman, North Brunswick, and Thomas V. Bolger, Merchantville, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1983, Ser. No. 501,908
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—21 R **14 Claims**

1. In a TV signal processing system including a source of a first pair of quadrature related color mixture signals associated

with a first set of coordinate axes, means for generating a second set of color mixture signals associated with a second set of coordinate axes, comprising:

means responsive to said first pair of color mixture signals for determining the vector sum, C, thereof;

means responsive to said first pair of color mixture signals for determining the angle, θ, between said vector sum and one axis of said first pair of axes;

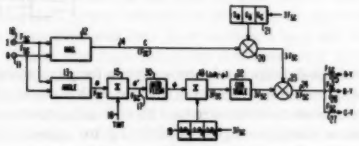
a source of angle values $\Delta\theta_i$, i being an index, said angle values being respectively equal to the angular separation between said one of said first pair of axis and each of said second set of coordinate axes;

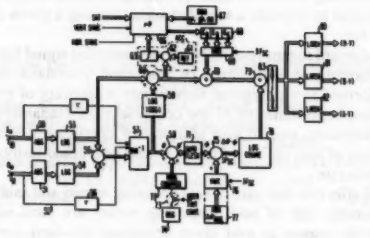
means responsive to said angular values for forming signal values equal to algebraic sums of said angle value $\Delta\theta_i$ and angles θ for each value of θ and $\Delta\theta_i$;

means for producing signal values corresponding to trigonometric ratios (TR_i) associated with said algebraic sums of said angles; and

means responsive to said trigonometric ratio values TR_i and the magnitude, C, for producing products of C times TR_i.

12. In a color TV signal processing system including a





source of quadrature related color mixture signals I and Q associated with coordinate axes $\overline{I}$ and $\overline{Q}$, a method for generating (R-Y), (B-Y) and (G-Y) color mixture signals associated with coordinate axes (R-Y) (B-Y) and (G-Y) respectively displaced from a reference axis by angles $\Delta\theta_R$, $\Delta\theta_B$, and $\Delta\theta_G$, said method comprising:

determining the magnitude, C, of the vector sum of the I and Q signals;

determining the angle θ between said vector sum and said reference axis;

generating respective algebraic sums of the angles θ and said angle values $\Delta\theta_R$, $\Delta\theta_B$ and $\Delta\theta_G$;

generating respective trigonometric ratios (for example cosines) associated with said algebraic sums, for projecting said vector sums onto said (R-Y), (B-Y) and (G-Y) axes;

multiplying the magnitude, C, by respective projection coefficients g_R, g_B and g_G; and

multiplying said respective trigonometric ratios associated with the angle indicies R, B, and G by the respective products of said coefficients times magnitude C associated with coefficient indicies R, B and G.

4,523,222

SET OF THREE INTEGRATED CIRCUITS FOR DIGITAL VIDEO SIGNAL PROCESSING IN COLOR-TELEVISION RECEIVERS

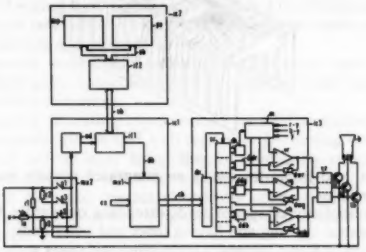
Laurin C. Freyberger, Bahlingen; Daniel Mlynek, Wolfgantzen, and Friedrich Schmidtpott, Gundelfingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 10, 1983, Ser. No. 465,697

Claims priority, application European Pat. Off., Feb. 27, 1982, 82101519.5

Int. Cl.³ H04N 9/535

U.S. Cl. 358—27 **8 Claims**



1. Set of three integrated circuits(ic1, ic2, ic3) for digital video-signal processing in color-television receivers,

wherein the first integrated circuit (ic1) contains an analog-to-digital converter (ad) followed by a first bus interface circuit (if1) for a serial data bus (sb), and a first multiplexer (mx1) following the first bus interface circuit (if1), the analog-to-digital converter (ad) being fed with measured data corresponding to the cathode currents of the picture tube (b) flowing at "black" (="dark current") and "white" (="white level") in each of the three electron guns, and with the signal of an ambient-light detector (ls) via a second multiplexer (mx) in the vertical blanking interval, and the first multiplexer (mx1) being fed with the processed digital chrominance signals (cs),

wherein the second integrated circuit (ic2) contains a microprocessor (mp), an electrically reprogrammable memory (ps), and a second serial-data-bus interface circuit (if2) corresponding to the first bus interface circuit (if1), the memory (ps) holding alignment data and nominal dark-current/white-level data of the picture tube used (b) which were entered by the manufacturer of the color-television receiver and, together with the measured data, are used by the microprocessor (mp) to generate video-signal-independent operating data for the picture tube (b), and

wherein the third integrated circuit (ic3) contains a demultiplexer (dx), an analog RGB matrix (m), and three analog amplifiers (vr, vg, vb) each designed to drive one of the electron guns via an external video output stage (ve), the dark current of the picture tube (b) being adjusted via the operating point of the respective analog amplifier, and the white level of the picture tube (b) being adjusted by adjusting the gain of the respective amplifier after digital-to-analog conversion, and with the demultiplexer (dx) connected to the first multiplexer (mx1)of the first integrated circuit (ic1) via a chroma bus (cb),

Characterized by the Following Features:

The first multiplexer (mx1) consists of three electronic switches (s1, s2, s3),

the first of which (s1) has its input grounded through a first resistor (r1) and connected to the collectors of external transistors (tr, tg, tb) which are each associated with one of the electron guns and the base of each of which is driven by the associated video output stage, while the emitter is connected to the associated electron gun system,

and the output of the first switch (s1) is connected to the input of the analog-to-digital converter (ad);

the second of which (s2) has its input connected to the light detector (ls), while its output is coupled with the input of the analog-to-digital converter (ad), and

the third of which (s3) has its input connected to the input of the first electronic switch (s1) via a second resistor (r2), and its output is grounded, the value of the second resistor (r2) being about one order of magnitude smaller than that of the first resistor (r1);

the three electronic switches (s1, s2, s3) have the following positions:

	s1	s2	s3
during vertical sweep	closed	open	closed
during vertical retrace: for leakage/light-det. current meas.	closed/open	open/closed	open/closed
for white level measurement	closed	open	closed
for dark current measurement	closed	open	open

the measurements of the dark current together with the white level of each electron gun and the measurements of the light-detector current together with the cathode leakage currents are performed in four successive vertical blanking intervals;

to this end, the cathodes are connected at one end to a voltage for blacker than black (us), and at the other end to a voltage for black (ud) and then to a voltage for white (uw) in accordance with the following table:

Vertical blanking interval No.	Measurement: in the first half of the vertical blanking interval	Measurement: at about the end of the vertical blanking interval	Cathode: red	Cathode: green	Cathode: blue
1	Leakage currents of the cathodes	Light-detector current	us	us	us
2	Dark current red	White level red	ud/uw	us	us
3	Dark current green	White level green	us	ud/uw	us
4	Dark current blue	White level blue	us	us	ud/uw

the measured data are transferred from the analog-to-digital converter (ad) to the microprocessor (mp) of the second integrated circuit (ic2) via the two interface circuits (if1, if2) and the data bus (sb) at an appropriate instant, and

the video-signal-independent operating data for the picture tube (b), which are generated by the microprocessor (mp), are transferred from the second integrated circuit (ic2) via the two interface circuits (if1, if2) and a line (db) to the first multiplexer (mx1) of the first integrated circuit (ic1) at an appropriate instant, and from there over a wire of the chroma bus (cb) into a shift register (sr) of the third integrated circuit (ic3) shortly after the beginning of the next vertical blanking interval, the parallel outputs of which shift register (sr) are combined in groups each assigned to one type of operating value, and each of the groups is connected to one digital-to-analog converter (dh, ddr, ddg, ddd, dwr, dwg, dwb) which drives the RGB matrix (m) or the respective analog amplifier (vr, vg, vb).

4,523,223

METHOD AND APPARATUS FOR CONTROLLING THE DIGITAL CHROMINANCE SIGNALS OF A COLOR TELEVISION RECEIVER

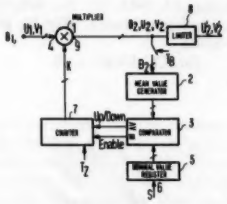
Rainer Lüder, Oberhaching, and Wolfgang Haussmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,265

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3123038

Int. Cl.³ H04N 9/535

U.S. Cl. 358—27 **8 Claims**



1. Method for forming and controlling the digital chrominance signals of a color television receiver depending upon the amplitude of the color burst signal, which comprises multiplying the digital chrominance signal and the color burst signal by a coefficient in a multiplier, forming a mean value of the color burst amplitude of the burst signal from an output signal of the multiplier, comparing the mean value of the burst amplitude with a nominal value corresponding to a desired color contrast setting thereby producing said coefficient.

4,523,224

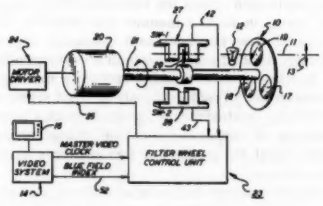
COLOR FILTER WHEEL SYNCHRONIZER

Andrew Longacre, Jr., Skaneateles, N.Y., assignor to Welch Allyn Inc., Skaneateles Falls, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,471

Int. Cl.³ H04N 9/04

U.S. Cl. 358—42 **8 Claims**



1. A method synchronizing the rotational speed of a color filter wheel to the field rate of a video system that includes the steps of

driving a color filter wheel with a stepping motor to sequentially advance different color filters past a fixed optical axis,

deriving the input of the stepping motor from the output of the master clock of the video system,

adjusting the rate of the stepping motor input signal by an amount equal to the number of cycles of the master clock output signal contained in each video field divided by the number of steps required to bring each color filter past the fixed optical axis,

phase locking the input signal applied to the motor to the output signal of the master clock by advancing the speed

of the motor in steps up to a desired synchronous speed which is related to the video field rate, and

monitoring the rotational speed of the wheel and automatically reinitiating the stepping of the motor in the event the wheel speed falls below a predetermined rate.

4,523,225

IMAGE DISPLAY APPARATUS

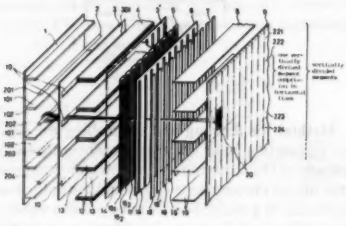
Mitsuya Masuda, Takatsuki; Sadahiro Iyehara, Suita; Shizuo Inohara, Toyonaka; Minoru Ueda, Takatsuki; Keisuke Yamamoto, Ibaraki, and Yoshio Yasumoto, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 13, 1983, Ser. No. 494,311

Claims priority, application Japan, May 13, 1982, 57-80902; May 17, 1982, 57-83446

Int. Cl.³ H04N *5/66*

U.S. Cl. 358—56 **4 Claims**



1. A display apparatus comprising:

a phosphor screen comprising a first predetermined number of horizontally divided sections,

a second predetermined number of electron beam sources for in-turn emitting said second predetermined number of horizontal rows of electron beams, each row having said first predetermined number of electron beams, producing one horizontal line on said screen,

horizontal deflection means for selective impingements of said electron beams on regions of in-turn selected corresponding positions of said horizontally divided sections at one time,

vertical deflection means for vertically deflecting said electron beams in such a manner that electron beams of a horizontal row impinges said phosphor screen in one vertically divided segment which is corresponding to said one horizontal row, thereby vertically moving said one horizontal line in said vertically divided segment,

electron beam control means for simultaneous controlling of intensities of respective electron beams responding to image signal to produce a line-at-a-time displaying of video picture,

a flat shaped vacuum enclosure containing said above-mentioned components therein, one end face thereof forming a screen face in which said phosphor screen is provided, wherein

said horizontal deflection means and said vertical deflection means comprises:

digital memory means which stores data of digital deflection signals for deflections of said electron beam,

D/A converters for converting said data of digital deflection signals into analog signals, and

address counters for controlling said digital memory means,

said digital memory means comprising first memory means which stores data of said digital deflection signals for odd number field and second memory means which stores data of said digital deflection signals for even number field,

said address counters, issuing different address signals for odd number field and even number field, thereby to make accessing in said first memory means and said second memory means for said odd number field and said even number field, respectively.

4,523,226

STEREOSCOPIC TELEVISION SYSTEM

Lenny Lipton, Pt. Richmond; Michael R. Starks, Fairfax; James D. Stewart, Oakland, and Lawrence D. Meyer, Ross, all of Calif., assignors to Stereographics Corporation, San Rafael, Calif.

Continuation-in-part of Ser. No. 343,124, Jan. 27, 1982, abandoned. This application Jan. 19, 1983, Ser. No. 459,174

Int. Cl.³ H04N *9/54*

U.S. Cl. 358—88 **42 Claims**

1. A television system having means for providing standard video fields of standard duration but with each field comprising a first subfield in its upper half with the image therein vertically compressed and a second subfield in its lower half with the image therein vertically compressed, said first and second subfields being separated by a blanking area including a vertical sync pulse.

4,523,227

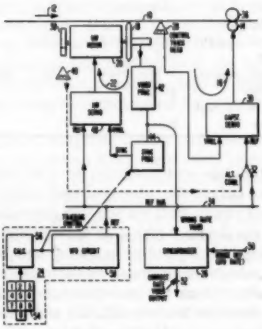
SYSTEM FOR SYNCHRONIZING A VIDEO SIGNAL HAVING A FIRST FRAME RATE TO A SECOND FRAME RATE

Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 201,436, Oct. 28, 1980, Pat. No. 4,393,415. This application Dec. 6, 1982, Ser. No. 447,140

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—105 **6 Claims**



1. Apparatus for synchronizing video signals from a video signal source, said video signals being organized into recurrent frames having a first frame rate, to frame synchronizing signals having a second frame rate produced by a source of frame synchronizing signals, said apparatus comprising:

storage means coupled to said video signal source for receiving said video signals for continuously writing said video signals into said storage means at said first frame rate and

for storing a predetermined number of said frames of said video signal to form stored video signals;

reading means coupled to said storage means and to said source of frame synchronizing signals for reading said video signals from said storage means at said second frame rate, whereby said writing and reading are of frames progressively more separated in time due to the disparity of said first and second frame rates when said first frame rate exceeds said second frame rate, and said writing and reading are of frames progressively less separated in time due to the disparity of said first and second frame rates when said second frame rate exceeds said first frame rate;

auxiliary reading means coupled to said storage means for reading that portion of said stored video signals representing said video signals written a first integer number of frames prior to that portion of said video signals currently being written;

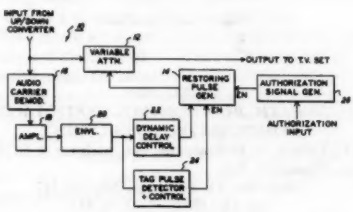
comparing means coupled to said video signal source, to said auxiliary reading means and to said source of frame synchronizing signals for comparing said video signals currently being written into said storage means with video signals derived from said auxiliary reading means for generating a control signal indicative of substantial similarity between the frame of said video signal currently being written and the frame of said stored video signals currently being read by said auxiliary reading means; and

switching means coupled to said reading means and to said comparing means for instantaneously changing said reading of said video signals from said storage means by said integer number of frames when said control signal indicates that said substantial similarlity exists between the frame of said video signals currently being written and the frame of said stored video signals currently being read by said auxiliary reading means, said changing of said reading of said video signals being in a sense to counteract the progressive change due to said disparity of said first and second frame rates.

4,523,228
SYNC SUPPRESSION SCRAMBLING OF TELEVISION SIGNALS FOR SUBSCRIPTION TV

Robert O. Banker, Cumming, Ga., assignor to Scientific Atlanta Inc., Atlanta, Ga.

Filed Feb. 15, 1983, Ser. No. 466,698
Int. Cl.³ H04N 7/16; H04K 1/04
U.S. Cl. 358—120 **12 Claims**

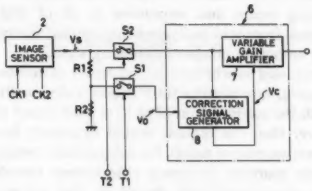


1. In a sync suppression scrambling system in which TV signals are transmitted with sync pulses thereof suppressed, together with timing pulses having a dynamically variable time delay relationship with said sync pulses and together with delay control pulses which represent said time relationship, descrambling apparatus which comprises means for restoring said suppressed sync pulses of said TV signal with restoring pulses, and means for operating said restoring means to generate said restoring pulses in different time relationships with said timing pulses depending upon the number of said delay control pulses which are detected in a given period of time.

4,523,229
SHADING CORRECTION DEVICE

Yoshiaki Kanmoto, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jun. 15, 1982, Ser. No. 388,679
Claims priority, application Japan, Jun. 15, 1981, 56-91689
Int. Cl.³ H04N 1/38
U.S. Cl. 358—163 **12 Claims**



1. A device for carrying out the shading correction of an image signal on the basis of a reference data obtained by scanning a reference density reflecting plate comprising:

image sensing means for converting light image information into an electrical image signal, said image sensing means being capable of storing an accumulated charge by scanning along different lines on said reflecting plate thereby forming an expanded image signal when supplied as an output;

control means for controlling the supply of said output from said image sensing means is an ordinary image signal or said expanded image signal;

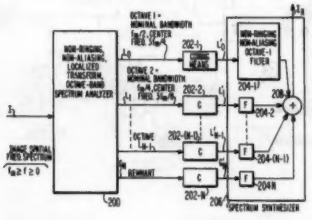
averaging means for taking an average of said expanded image signal to form said reference data; and

correction means for supplying a correction signal to be used in shading correction in response to said reference data.

4,523,230
SYSTEM FOR CORING AN IMAGE-REPRESENTING SIGNAL

Curtis R. Carlson; Edward H. Adelson, both of Princeton, and Charles H. Anderson, Rocky Hill, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 22, 1984, Ser. No. 663,152
Claims priority, application United Kingdom, Nov. 1, 1983, 8329109
Int. Cl.³ H04N 5/14, 5/21
U.S. Cl. 358—167 **24 Claims**



1. An image-processing system comprising:

a substantially non-ringing, non-aliasing, localized transform spectrum analyzer responsive to an input image-representing signal defined in at least one dimension of the represented image by a spectrum of spatial frequencies within a range extending downward from a maximum frequency f_m to zero, said analyzer separating said input-signal spectrum in descending spatial frequency order starting from f_m into a group of one or more contiguous bandpass subspectra output signals each of which subspectrum has a nominal bandwidth no greater than one octave within said range, and into a remnant subspectrum output signal con-

tining all those spatial frequencies of said input-signal spectrum which are below those contained in the lowest spatial frequency bandpass subspectrum output-signal;

means for coring at least one of said bandpass subspectra output signals and remnant subspectrum output signal, thereby introducing spurious out-of-band spatial frequency components into each cored subspectrum output signal; and

a spectrum synthesizer coupler to said analyzer through said coring means and responsive to all of said subspectra signals from said analyzer being applied thereto for deriving an output image-representing signal;

wherein said synthesizer is comprised of substantially non-ringing, non-aliasing filter means individually associated with the subspectrum of at least each cored signal that is lower than the highest spatial frequency bandpass subspectrum output signal, for substantially removing at least those spurious frequency components therefrom which are above-band with regard to that subspectrum, and means for summing all said subspectra signals, including both any that has been cored and/or filtered and any that has been neither cored nor filtered, thereby to derive said output image representing signal;

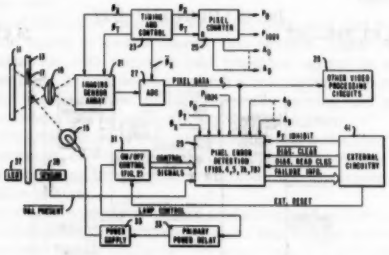
whereby any noise component originally present in the spectrum of said input image-representing signal has been reduced in the spectrum of said output image-representing signal without introducing any signifficant amount of aliasing or other spurious spatial frequency component in the spectrum of said output image-representing signal.

4,523,231

METHOD AND SYSTEM FOR AUTOMATICALLY DETECTING CAMERA PICTURE ELEMENT FAILURE

Roger H. Therrien, Waterloo, Canada, assignor to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Jan. 26, 1983, Ser. No. 461,056
Int. Cl.³ H04N *5/30*
U.S. Cl. 358—139 **17 Claims**



1. A system comprising:

a reference background for reflecting radiant energy impinging thereon;

means for illuminating said reference background with radiant energy during a mode of operation;

scanning means having at least one array containing N image viewing elements for providing N reference signal pixels for each scan of said reference background;

first means for producing an error signal during said mode of operation whenever any given reference signal pixel is less than a reference level; and

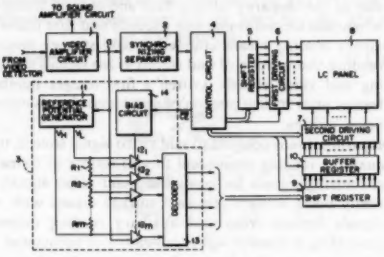
second means responsive to said error signal for indicating that at least one of said elements in said array is defective.

4,523,232

VIDEO SIGNAL ANALOG-TO-DIGITAL CONVERTER FOR AN IMAGE DISPLAY APPARATUS

Osamu Kameda, and Takahiro Fuse, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,547
Claims priority, application Japan, Mar. 24, 1982, 57-46776
Int. Cl.³ H04N *5/14, 5/66*
U.S. Cl. 358—236 **5 Claims**



1. A video signal analog-to-digital converter for an image display device, which samples a video signal and converts the sampled video signal into n-bit digital codes used to control the brightness of the image displayed, comprising:

reference potential generating means including means for detecting the average level of a video signal, means for generating an upper and lower reference potential for setting a reference potential width, and means connected to said video signal average level detecting means for generating a variable upper and a variable lower reference potential for setting a potential width, over which said video signal is coded, by varying said upper and lower reference potentials according to variations in the average level of said video signal;

means connected to said reference potential generating means for analog-to-digital converting said video signal in the potential range between the upper and lower reference potentials determined by the average level of said video signal; and

bias circuit means connected to said analog-to-digital converting means for generating and supplying a bias signal to provide it to the said analog-to-digital converting means.

4,523,233

AUTOMATIC BIAS CONTROL SYSTEM WITH COMPENSATED SENSE POINT

James C. Tallant, II, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 12, 1982, Ser. No. 441,217
Int. Cl.³ H04N *5/68, 9/535*
U.S. Cl. 358—242 **32 Claims**

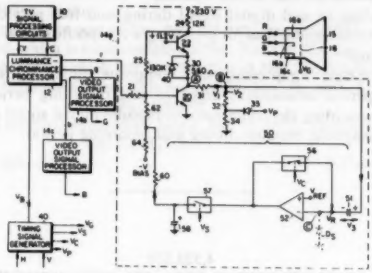
1. In a system including a video signal channel for processing video signals including image and blanking intervals, apparatus comprising:

means coupled to a sensing point in said video channel for deriving a signal representative of an operating characteristic of said video channel during image blanking intervals;

signal processing means responsive to said derived representative signal for providing a control signal to said video channel for maintaining a desired condition of said operating characteristic; and

means, coupled to said sensing point and responsive to video

signals during image intervals, for attenuating amplitude excursions manifested by video signals at said sensing



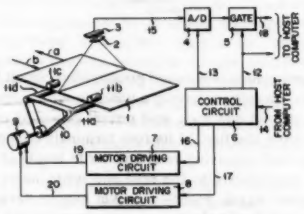
point during image intervals when said amplitude excursions exceed a given threshold level.

4,523,234

SCANNING CONTROL APPARATUS AND METHOD THEREFOR

Akio Sangu, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 24, 1983, Ser. No. 497,680
Claims priority, application Japan, Jun. 2, 1982, 57-93157
Int. Cl.³ H04M 1/10
U.S. Cl. 358—293 **8 Claims**



1. A scanning control means, comprising:
a. scanning means for line-scanning an object;
b. feeding means for feeding the object in a direction perpendicular to a direction of the line-scanning;
c. driving means for selectively driving said feeding means in a forward direction or a backward direction; and
d. control means for controlling said driving means and said scanning means such that said driving means drives said feeding means in a backward direction for a predetermined time after the apparatus is started, and then drives said feeding means in a forward direction until the forward velocity becomes constant before said scanning means produces scanned data.

4,523,235

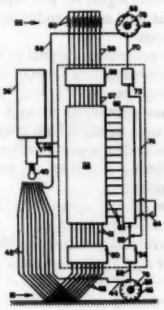
ELECTRONIC MICROCOPIER APPARATUS

Jan Rajchman, 268 Edgerstoune Rd., Princeton, N.J. 08540

Filed Jan. 11, 1982, Ser. No. 338,505
Int. Cl.³ H04N 1/02
U.S. Cl. 358—256 **35 Claims**

1. A pocket sized copying apparatus that copies by manually sweeping said apparatus across the material to be copied and subsequently manually sweeping said apparatus across the material upon which the copy is to be made, said apparatus comprising:

optical reading means for reading the information to be copied and for producing signals related thereto;
addressable electronic memory means for storing said information read by said optical reading means;
writing means controlled by said information stored by said addressable electronic memory means for reproducing the information to be copied;
position reckoning means for producing signals codifying the position of said reading means when it is swept across



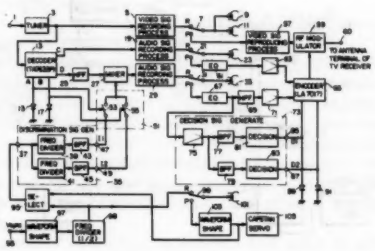
the material to be copied and for codifying the position of said writing means when it is subsequently swept across the material upon which the copy is to be made;
addressing means to address said addressable electronic memory means in accordance with said position codifying signals,
wherein said optical reading means, memory means, writing means, position reckoning means and said addressing means are physically integrated into a hand-holdable unit.

4,523,236

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS, INCLUDING MEANS FOR DISCRIMINATING THE MODE OF MULTIPLEXING OF AN AUDIO SIGNAL

Nobutaka Hayashi, and Yoshinori Komori, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed May 21, 1982, Ser. No. 380,825
Claims priority, application Japan, Jun. 19, 1981, 56-95498; Jul. 6, 1981, 56-100983[U]
Int. Cl.³ H04N 5/76
U.S. Cl. 358—341 **15 Claims**



1. A video signal recording/reproducing apparatus, comprising:
a recording medium including at least one audio track, at least one video track and at least one control track,
video track recording means for recording a video signal in said video track,
audio track recording means for recording an audio signal corresponding to said signal in said audio track,

said audio signal being recordable in a stereo mode, a bilingual mode or a monaural mode, corresponding to the video signal to be recorded,

control track recording means for recording a control signal in said control track,

mode discrimination signal producing means for generating a mode discrimination signal of a relatively low frequency representing the mode of said audio signal,

discrimination signal providing means coupled to said mode discrimination signal producing means and adapted to receive said audio signal for providing said mode discrimination signal as well as said audio signal to said audio track recording means,

select means for providing a signal to be used for generating said mode discrimination signal to said discrimination signal providing means,

said select means providing to said discrimination signal providing means a signal which is identical to said control signal to be recorded in said control track of said recording medium by said control track recording means on the occasion of recording,

video track reproducing means for reproducing the video signal from said video track,

audio track reproducing means for reproducing said audio signal and said mode discrimination signal from said audio track,

means for reproducing said control signal recorded in said control track,

means for bringing said reproduced control signal to a predetermined phase relation with said reproduced mode discrimination signal,

decision signal generating means responsive to the mode discrimination signal included in the reproduced signal from said audio track reproducing means for generating a decision signal representing the mode of said audio signal by comparing said reproduced control signal brought to said predetermined phase relation and said reproduced mode discrimination signal.

4,523,237

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING AN ANALOG SIGNAL

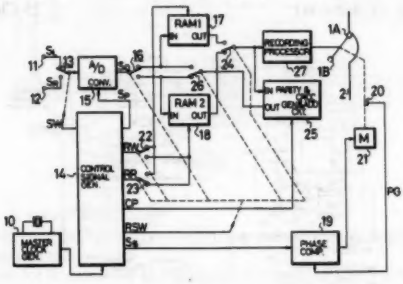
Shinichi Fukuda, Tokyo, and Kentaro Odaka, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 485,065

Claims priority, application Japan, Apr. 15, 1982, 57-62838

Int. Cl.³ G11B *5/60*

U.S. Cl. 360—8 **23 Claims**



1. A method of recording an analog signal on a magnetic medium using at least two recording heads that periodically trace the magnetic medium, the method comprising the steps of:

providing a digital signal corresponding to a predetermined real time signal period of the analog signal;

tracing the magnetic medium with the heads to provide at least one recording period during each said predetermined real time signal period, the duration of said at least one recording period being shorter than said real time signal period to provide at least one free period when all of the heads are free of the medium;

adding to said digital signal during said free period additional digital data for providing a composite digital signal; and

time-base compressing said composite digital signal to a period substantially equal to said recording period for recording the compressed composite digital signal on the magnetic medium during said recording period.

4,523,238

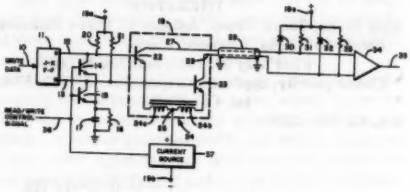
MAGNETIC HEAD PREAMPLIFIER/DRIVER

Beat G. Keel, Prior Lake, and Robert W. Johnson, Bloomington, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Feb. 15, 1983, Ser. No. 466,400

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—46 **4 Claims**



1. A combination driver and preamplifier circuit for use with a magnetic transducer having a winding with a center tap and first and second end taps, said circuit powered by a current source having the first of its two terminals connected to the center tap and supplying read and write levels of current responsive respectively to the read and write states of a read/write control signal, and by a power supply having first and second terminals of polarity respectively matching the polarity of the first and second terminals of the current source, the second of its two terminals being connected to the second of the current source terminals, said circuit modulating the write current flow through the winding responsive to a bipolar write data signal, and preamplifying the read-back signal generated in the winding by a fluctuating magnetic field applied thereto, comprising:

(a) first and second transistors each having their emitters connected to the first and second end taps respectively;

(b) a pair of pull-up resistors, each connected between one transistor base and the first power supply terminal;

(c) a pair of write data lines, each connected at a first end to one transistor base and each receiving one half of the bipolar write data signal at the second end thereof;

(d) a pair of clamp circuits, each connected between one write line and an AC ground point, and receiving the read/write control signal, and responsive to the read and write mode states respectively of the read/write control signal, clamping and unclamping the write data lines to AC ground;

(e) a pair of read data lines, each connected at its first end to one transistor collector, and supplying at their second ends the preamplified read-back signal; and

(f) a pair of non-linear collector pull-up impedances each connected between the second end of one read data line and the first power supply terminal.

4,523,239

TAPE RECORDER HAVING AN ALARM AND STOP MECHANISM FOR END-OF-TAPE CONDITIONS

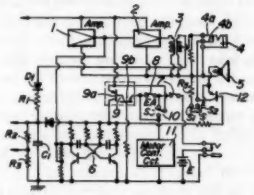
Teruo Iwasawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 295,328, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 116,753, Jan. 30, 1980, abandoned, which is a continuation of Ser. No. 924,807, Jul. 14, 1978, abandoned. This application Jun. 29, 1983, Ser. No. 509,098

Claims priority, application Japan, Jul. 16, 1977, 52-85349

Int. Cl.[3] G11B *15/22*

U.S. Cl. 360—74.1 5 Claims



1. In a tape recorder having a final end alarm mechanism for producing an alarm sound when a tape reaches a final end and an automatic stop mechanism for stopping said tape, the improvement comprising a selective switch for selectively switching between a first and second condition, said first condition permitting the operation of the final end alarm mechanism and a second condition preventing the operation of said final end alarm mechanism, both conditions also permitting the normal operation of the automatic stop mechanism, said selective switch including:

a first switch for indicating an end of tape condition;

a second switch coupled to said first switch and including a pair of semiconductor elements for controlling power supplied to the alarm mechanism and automatic stop mechanism; and

a third switch in connection with said first and second switches for making the selection between said first and second condition; and; including a motor control circuit wherein said first switch is a normally closed switch and having a power source applied at one end, said third switch having an arm, an alarm contact and a motor off contact, said second switch including a first and second transistor, said first transistor stopping current through its emitter at the time of ending of the tape, having its emitter connected to the arm of said third switch, having its collector connected to the final end alarm mechanism and having its base connected to a collector of the second transistor; said second transistor having its emitter connected to one end of said first switch and to said motor off contact and being coupled to a motor control circuit with said recorder so that when said third switch has its arm connected to its alarm contact and when the first switch opens, power supplied to the motor control circuit will stop and power will be supplied through the second switch to the alarm, and when said third switch has its arm connected to its motor off contact and when the first switch opens, power supplied to the motor will stop and the second switch will prevent supply of power to the alarm.

4,523,240

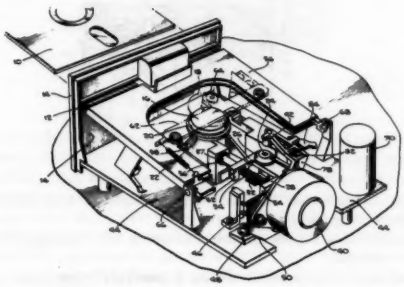
HIGH PRECISION FLOPPY DISC MEMORY SYSTEM

Ericson M. Dunstan, Hidden Hills; William J. Gervais, Northridge, and S. Barry McClelland, Woodland Hills, all of Calif., assignors to Micropolis, Chatsworth, Calif.

Continuation-in-part of Ser. No. 863,309, Dec. 22, 1977,. This application May 25, 1979, Ser. No. 42,721

Int. Cl.[3] G11B *5/016*

U.S. Cl. 360—99 14 Claims



1. A precision, high capacity floppy disc memory system having low thermal deviation, comprising:

a magnetic storage type floppy disc having a central mounting opening of a predetermined diameter;

means including a central rotatable hub having an outer diameter equal to or slightly greater than said predetermined diameter for accurately mounting said magnetic storage type floppy disc for rotation about said central mounting opening in the disc, the opening in said disc therefore making a "line on line" or an interference fit with said mounting means;

at least one head for magnetically reading and/or writing on said magnetic disc;

means including a lead screw having a precision groove for selectively shifting the position of said head to different tracks on said storage disc;

means for mounting the inner end of said lead screw fixed against longitudinal movement along the axis of said screw relative to said rotatable hub adjacent the center of said magnetic disc;

carriage means for supporting said head in close physical proximity to said lead screw;

tapered means secured to said carriage and resiliently mating with a single turn of the groove in said lead screw substantially in one plane only along the length of said lead screw and making contact with said lead screw at only two points or along only two lines to cause the magnetic head to precisely move to the radial position indicated by the orientation of said lead screw despite wear in said lead screw; said tapered means being in close physical proximity to said head;

stepping motor means for rotating said lead screw to shift said head between tracks, said stepping motor means having more accurately located angular step positions spaced apart by a predetermined number of normal steps of said stepping motor means; and

said apparatus further including means for actuating said stepping motor means in either direction by an angle equal to said predetermined number of steps to move said head between adjacent tracks which are less than 0.015 inch apart.

4,523,241

HEAD SHIFT MECHANISM IN A MAGNETIC TAPE APPARATUS

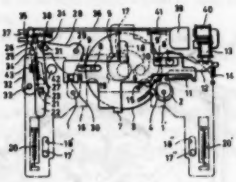
Yukio Ito; Kazuki Takai, and Satoshi Takagi, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 391,069

Claims priority, application Japan, Jun. 24, 1981, 56-96734; Jun. 25, 1981, 56-97571

Int. Cl.³ G11B *5/54*

U.S. Cl. 360—105 **5 Claims**



1. A head shift mechanism in a magnetic tape apparatus which comprises:

a rotatably supported gear and means for effecting rotation thereof;

an engaging member which is movably supported and is intermittently engageable with said gear;

a cam member which is operatively coupled to and moves simultaneously with said engaging member;

a movably supported changeover member having means cooperable with said cam member for effecting movement of said changeover member in response to movement of said cam member;

selectively actuable means for causing said engaging member to operatively engage said gear, said gear effecting movement of said engaging member when engaged therewith;

an operating member which is movably supported and has a magnetic head supported thereon, said operating member and said magnetic head being movable between advanced and retracted positions;

a control member responsive to movement of said changeover member and cooperable with said operating member, said control member effecting movement of said operating member toward said advanced position in response to movement of said changeover member;

lock means for releasably locking said control member in a position in which it holds said magnetic head and said operating member in said advanced position; and

selectively actuable means for causing said lock means to release said control member.

4,523,242

MAGNETIC HEAD ADJUSTING APPARATUS

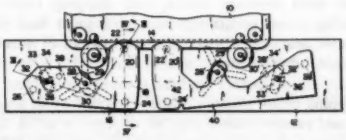
Shoichi Saito, and Kazumi Miyazi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,442

Claims priority, application Japan, Aug. 25, 1981, 56-125574[U]

Int. Cl.³ G11B *21/24*

U.S. Cl. 360—109 **2 Claims**



1. A magnetic head adjusting apparatus comprising:

a generally planar base;

a generally planar auxiliary base disposed to extend over the base for supporting a magnetic head;

a first adjusting member engaged with the base to be in contact with a surface of the auxiliary base which faces the base, said first adjusting member being arranged to move in a direction transverse of the base plane to move the auxiliary base in the same direction and coupled with the auxiliary base to support the auxiliary base for rotation around the first adjusting member;

a second adjusting member engaged with the base at a position away from the first adjusting member to be in contact with the surface of the auxiliary base which faces the base, and arranged to move in a direction transverse of the base plane to move the auxiliary base in the same direction;

a third adjusting member engaged with the base at a position away from those of the first and the second adjusting members to be in contact with the surface of the auxiliary base which faces the base so that the first, the second and the third adjusting members form three vertexes of a triangle, said third adjusting member also being arranged to move in a direction transverse of the base plane to move the auxiliary base in the same direction; and

a rotating member mounted for relative rotation on the base and coupled with a portion of the auxiliary base which is away from the first adjusting member and at a position offset from the axis of rotation of the rotating member relative to the base, so that the auxiliary base is rotated around the first adjusting member as the rotating member is rotated relative to the base;

wherein said first adjusting member is a screw having a pin on its front end face, said auxiliary base has a conical opening extending outward from the surface of the auxiliary base which faces the base in the direction in which the first adjusting member extends from the base, and the pin of the first adjusting member engages said conical opening, and said second and said third adjusting members are screws.

4,523,243

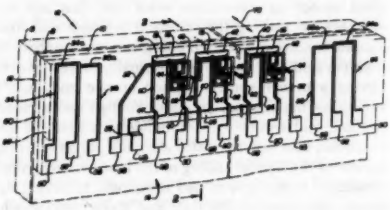
MAGNETORESISTIVE TRANSDUCER USING AN INDEPENDENT RECESSED ELECTROMAGNETIC BIAS

Robert L. Billington, Lafayette, Colo., assignor to Storage Technology Corporation

Filed May 24, 1982, Ser. No. 381,387

Int. Cl.³ G11B *5/12, 5/30*; H01L *43/02*; G01R *33/02*

U.S. Cl. 360—113 **25 Claims**



1. A thin film magnetoresistive transducer for sensing the magnetic field recorded on a magnetic medium, comprising:

a planar substrate;

a thin film magnetoresistive sense element located on the substrate at the edge thereof;

a plurality of conductive leads connected to the sense element for supplying sense current to the sense element in a differential configuration;

a first dielectric member deposited over said sense element, conductive leads, and substrate; and

a bias conductor located on the first dielectric member opposite the sense element to provide a bias current there-

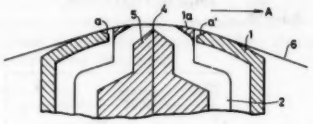
for, wherein the bias conductor is electrically isolated from the sense element to facilitate separate optimization of bias and sense currents for the transducer.

4,523,244

MAGNETIC HEAD

Naohiko Toshimitsu, and Masayuki Fujimura, both of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Filed Jun. 10, 1982, Ser. No. 386,875
Claims priority, application Japan, Jul. 15, 1981, 56-109401
Int. Cl.³ G11B *5/10*
U.S. Cl. 360—129 **2 Claims**



1. A magnetic head assembly comprising at least two magnetic head elements disposed proximate to each other for recording information in or reproducing information from respective tracks on a magnetic recording medium and a housing of magnetic material for magnetically shielding said magnetic head elements; wherein:

each of said magnetic head elements includes a magnetic core having a gap therein;

said housing includes an opening for exposing the recording medium to said gaps as the recording medium travels relative to said opening in a predetermined direction over a surface of said housing;

said opening has at least one edge extending substantially perpendicular to the predetermined direction of travel of the recording medium; and

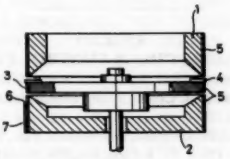
at least one said edge has a chamfered portion at said surface.

4,523,245

SLIDING MEMBER

Shiro Takahashi, Sendai, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP81/00366, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982, PCT Pub. No. WO82/01896, PCT Pub. Date Jun. 10, 1982
PCT Filed Dec. 4, 1981, Ser. No. 414,334
Claims priority, application Japan, Dec. 5, 1980, 55-174654[U]
Int. Cl.³ G11B *5/10, 5/40*
U.S. Cl. 360—130.21 **4 Claims**



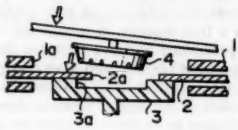
1. A magnetic head drum assembly comprising first and second cylindrical drums coaxially supported to form a composite guiding surface for a traveling magnetic recording medium, said first and second drums being spaced by an axial gap, at least one magnetic head extending into said axial gap and arranged to contact a traveling magnetic recording medium on said guiding surface, and at least a portion of said guiding surface being composed of an amorphous metallic material.

4,523,246

FLEXIBLE MAGNETIC DISK

Yasutoshi Okuzawa, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1984, Ser. No. 591,878
Claims priority, application Japan, Mar. 29, 1983, 58-53171
Int. Cl.³ G11B *23/02, 5/016*
U.S. Cl. 360—133 **5 Claims**



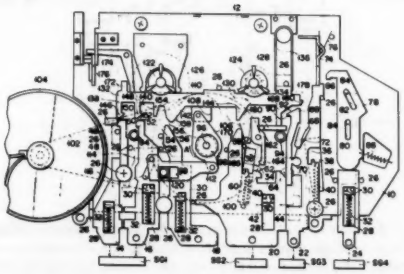
1. A flexible magnetic disk comprising a jacket and a flexible magnetic disk sheet housed in said jacket, said flexible magnetic disk sheet being provided at the center thereof with a circular hole for loading into an information writing and read-out apparatus, said jacket being provided with an aperture for exposing said circular hole of said flexible magnetic disk sheet, wherein the improvement comprises applying a lubricant onto one surface or both surfaces of said flexible magnetic disk sheet at the peripheral edge portion of said circular hole which comes into contact with at least one sheet positioning member of said information writing and read-out apparatus, thereby decreasing the coefficient of frcition of said peripheral edge portion of said circular hole.

4,523,247

SIGNAL DETECTION OPERATING LEVER DEVICE OF MAGNETIC RECORDING TAPE REPRODUCING APPARATUS

Shigeru Nemoto; Gōrō Kitajima; Sinichi Saitou, and Hazime Osada, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 382,207, May 26, 1982,. This application Jul. 9, 1984, Ser. No. 628,122
Claims priority, application Japan, May 28, 1981, 56-81721
Int. Cl.³ G11B *15/48, 15/18, 15/32;* G03B *1/04*
U.S. Cl. 360—137 **3 Claims**



1. A signal detection operating lever device for a magnetic recording tape reproducing apparatus which uses a tape cassette and which sets a magnetic recording tape transport mode comprising:

a first base plate;

a second base plate parallel to said first base plate with a distance therebetween;

a first operating lever disposed between said first and second base plates to be movable along the first and second base plates between a first position and a second position to

determine a magnetic recording tape transport mode in the magnetic recording tape reproducing apparatus;

a second operating lever having a magnetic head and disposed between said first and second base plates to move said magnetic head along said first and second base plates between a first position in which said magnetic head is separated from the magnetic recording tape of the tape cassette and a second position in which said magnetic head comes in contact with the magnetic recording tape;

an accidental erasure preventive lever disposed at least at one of said first and second base plates to be movable between a first position in which said second operating lever is prohibited to move from the first position to the second position thereof, and a second position in which said second operating lever is allowed to move from the first position to the second position thereof;

a third operating lever disposed between said first and second base plates to be movable between a first position which allows movement of said accidental erasure preventive lever between the first and second positions thereof along said first and second base plates, and a second position in which said accidental erasure preventing lever is kept at the second position thereof; and

magnetic head function selecting means connected to said second and third operating levers for allowing said magnetic head to function as an erase head upon movement of said second operating lever to the second position thereof and for allowing said magnetic head to function as a signal detecting head upon movement of said third operating lever to the second position thereof.

4,523,248

SAFETY CIRCUIT FOR A DETACHABLE CONNECTING CABLE

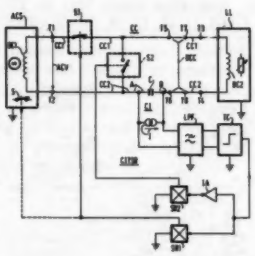
Peter C. Schmale, and Marinus C. W. Van Buul, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 31, 1983, Ser. No. 499,599

Claims priority, application Netherlands, Jun. 4, 1982, 8202259

Int. Cl.³ H02H *3/20*

U.S. Cl. 361—1 **19 Claims**



1. A safety circuit for use in a power supply system including an a.c. voltage supply source, a load and a connecting cable between the source and the load, the connecting cable having two cable conductors coupled to two connecting terminals of the a.c. voltage supply source and the load, respectively, with the cable having a detachable cable connection between the load and the a.c. voltage supply source, the safety circuit being operative to prevent the a.c. supply voltage from occurring between the cable conductors in the event the cable connection is in a non-connected state, the safety circuit comprising a switching circuit which comprises an on/off switch of the power supply system, a parallel arrangement of at least one capacitor and a direct current source connected in a direct current circuit which comprises a direct current path between the connecting terminals of the a.c. voltage supply source and the load, and the cable conductors connected thereto, means coupling said parallel arrangement via a threshold circuit having a threshold voltage value to the switching circuit comprising the on/off switch of the power supply system, said switch being switched on or off, before or after, respectively, the threshold voltage value has been exceeded by the voltage across said parallel arrangement.

4,523,249

ALTERNATING CURRENT LIMITING APPARATUS

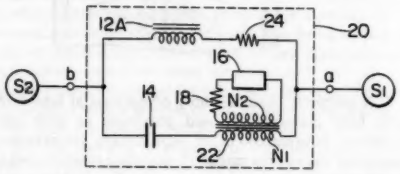
Satomi Arimoto, Nishinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,644

Claims priority, application Japan, Sep. 21, 1982, 57-165532

Int. Cl.³ H02H *9/02*

U.S. Cl. 361—58 **5 Claims**



1. An alternating current limiting apparatus comprising:

a first circuit formed of a series combination, of a capacitor and a winding means, connected between two different kinds of power systems;

a second circuit formed of a series combination, of a first resistor and a closing device, connected across the output terminals of said winding means;

and a third circuit formed of a series combination, of a reactor and a second resistor, connected in parallel with said first circuit;

said closing device of said second circuit being normally kept in its open state to form a series resonance circuit of said winding means and said capacitor and to interconnect said systems with the resultant impedance of said first circuit being zero, while upon system faults said closing device of said second circuit being closed to switch the impedance as seen from the input terminals of said winding means over to a predetermined small value to detune the resonance point of said series resonance circuit, thereby forming a parallel resonance circuit between the series combination of the small impedance with said capacitor and said third circuit to enlarge the total impedance value between said systems with an overcurrent therebetween being suppressed.

4,523,250

MAGNETIC CHUCK CONTROL SYSTEM

Daniel P. Bacchiere, 7067 Birchwood Ave., Niles, Ill. 60648, and Stanley F. Polinski, Chicago, Ill., assignors to Daniel P. Bacchiere, Niles, Ill.

PCT No. PCT/US80/01624, § 371 Date Feb. 9, 1982, § 102(e) Date Feb. 9, 1982, PCT Pub. No. WO81/01769, PCT Pub. Date Jun. 25, 1981

Continuation-in-part of Ser. No. 101,508, Dec. 7, 1979, Pat. No. 4,306,269. This PCT application Dec. 8, 1980, Ser. No. 479,867

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ H01F *13/00*

U.S. Cl. 361—145 **7 Claims**

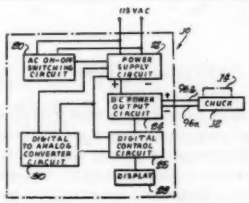
1. A system for magnetizing and demagnetizing a magnetizable object, comprising, in combination,

a DC power supply including a power supply circuit having

an AC power supply and a bridge rectifier adapted to establish said DC power supply,

a power output circuit operatively connected to said DC power supply and a magnetizable object and adapted to apply DC voltage signals to the object in a manner to magnetize the object, said output circuit including a reversing circuit enabling reversing of the polarity of said DC voltage signals during demagnetizing, said reversing circuit defining a pair of input terminals connected in circuit with said DC power supply and a pair of output terminals connected to the object, bidirectional current control means selectively connected between said pairs of terminals so as to enable selective directional current flow through the object,

a digital control circuit operatively associated with said current control means and operative to effect predetermined sequential conditioning of said bidirectional current control means so as to enable current flow through the object in alternating directions,



a digital-to-analog converter circuit cooperative with said digital control circuit and adapted to produce successive output voltage signals of predetermined decreasing magnitude in direct relation to said predetermined conditioning of said bidirectional control means,

and means connected in circuit with said DC power supply and said reversing circuit and being responsive to said successive output signals to control successively decreasing DC voltage signals to the object, said digital control circuit being adapted to control said bidirectional current control means so that said successively decreasing DC voltage signals applied to the object are of alternating polarity,

said means for controlling said successively decreasing DC voltage signals to said object including switch means connected in said power supply circuit between said AC power supply and said bridge rectifier and being controlled by said digital-to-analog converter circuit and said digital control circuit.

4,523,251

ELECTRONIC APPARATUS COMPRISING AN INPUT STAGE WITH A BINARY OUTPUT CONNECTED TO A RELAY CONTROL CIRCUIT

Jürgen Erdmann; Karl O. Buchholz, and Hartmut Knappe, all of Waldkirch, Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,217

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140682; Feb. 8, 1982, 3204234

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—152 **3 Claims**

1. A relay control circuit for controlling a relay from an input stage having a binary output in the form of either a first output signal associated with an energised state of said relay or a second output signal associated with a deenergised state of said relay, the control circuit comprising:

a power source;

an energising circuit for energising said relay from said power source;

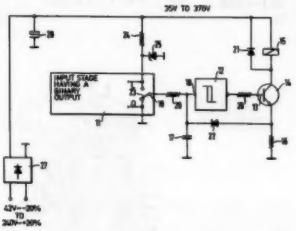
a first resistor lying in the energising circuit of said relay so that the voltage across said first resistor corresponds to the current flowing through said relay;

an electronic threshold switch having an input to which said binary output is connected via a second resistor;

a capacitor connected to said second resistor to form an RC circuit;

a semiconductor switching component determining whether or not current flows through said relay; and

means for tapping off said voltage from said first resistor and passing it to said input of said threshold switch,



whereby said threshold switch is periodically switched over in dependence on the current flowing through said relay, with said semiconductor switching component being thereby made alternately conductive and nonconductive, in such a way that said relay is periodically energised by a current continuously increasing from zero, is switched off each time a predetermined current is reached and is again re-energised with the increasing current shortly before it drops out.

4,523,252

DEVICE FOR ELIMINATING STATIC ELECTRICITY

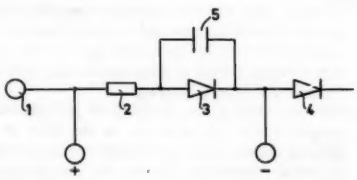
Jan O. Wallén, Strängnäs, Sweden, assignor to J-O Wallen Electronic Int. AB, Strangnas, Sweden

Filed Apr. 19, 1983, Ser. No. 486,432

Claims priority, application Sweden, Apr. 27, 1982, 8202628

Int. Cl.³ H05F *3/00*

U.S. Cl. 361—212 **1 Claim**



1. A device for eliminating static charge buildup of a first member from a second member, said device comprising:

a series circuit electrically connected to said first member, said series circuit including an electrical resistance and a tunnel diode, said tunnel diode being connected to conduct current away from said first member;

a coupling diode connected between said series circuit and said second member and having a polarity to conduct current toward said second member;

a capacitor connected in parallel with said tunnel diode; and

means for applying a small d.c. voltage across said series circuit to produce current flow through said series circuit in a direction away from said first member.

4,523,253

ENCAPSULATED MEDIUM-VOLTAGE ELECTRICAL LOAD SWITCHING APPARATUS

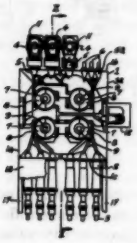
Kurt Grünberg, Offenbach; Rainer Poth, Bad Vilbel; Peter Werner, Oberursel; Kurt Koch, Neu-Isenburg; Friedrich Schweppe, Eppertshausen, and Kurt Voigtländer, Offenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,821

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107911

Int. Cl.³ H02B 1/04

U.S. Cl. 361—335 15 Claims



1. An encapsulated medium-voltage electrical load switching apparatus, comprising:

a generally rectangular parallelepiped-shaped metal housing having floor, ceiling, side, front and back walls, and being sealed against access from without;

a quantity of electronegative gas contained within the metal housing;

a switch arrangement, comprising at least three rotary switches oriented in the same direction within the metal housing with their rotary axes parallel to each other and extending between the front and back walls of the housing, the switches having front faces aligned in a vertical plane which is prependicular to the floor, ceiling and side walls, and each switch being able to be set to closed-circuited, open-circuited and grounded positions;

a plurality of insulated housings mounted within the metal housing, each insulated housing supporting a respective one of the switches, and each insulated housing containing a portion of the electronegative gas in a way which permits communication of the contained gas with the rest of the gas in the metal housing;

means, including a first plurality of gastight bushings arranged side-by-side in a row in the floor of the metal housing aligned with the reference plane and establishing electrical connections between the switches and external circuitry;

means, including a second plurality of gastight bushings arranged in pairs in two rows in the ceiling of the metal housing and establishing electrical connections between the switches and externally-positioned fuses connected across the pairs of bushings, the two rows being parallel to each other and also parallel to the row of the first plurality of bushings;

means, including a third plurality of gastight bushings arranged side-by-side in a row in the ceiling of the metal housing establishing electrical connections between the switches and the terminals of a transformer branch; and

switch control means, actuating the switches in a gastight way, for control of the position setting of the switches from outside the metal housing.

4,523,254

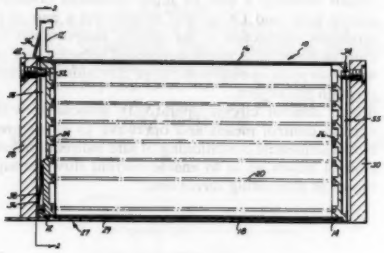
EQUIPMENT MODULE

Michael V. Konshak, Colorado Springs, Colo., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Dec. 28, 1983, Ser. No. 566,470

Int. Cl.³ H05K 7/16

U.S. Cl. 361—391 2 Claims



1. Apparatus for mounting a substantially cubical equipment module in a casing comprising:

a substantially cubical equipment module comprising:

a housing having two opposed vertically disposed mounting means for mounting printed circuit boards therebetween, the mounting means having top, rear and bottom edges;

a forward slot formed on the exterior of each of said mounting means, said slot having a vertical portion extending from adjacent the top edge of the mounting means to adjacent the bottom edge and an intersecting lower horizontal portion, the forward end of the horizontal portion being closed and the rearward end of the horizontal portion being open and communicating with the bottom edge of the mounting means;

a rearward slot formed on the exterior of each of said mounting means, said rearward slot having a vertical portion, shorter than the vertical portion of the foward slot, extending from adjacent the top edge of the mounting means and an intersecting lower horizontal portion, the forward end of the horizontal portion being closed and the rearward end of the horizontal portion being open and communicating with the rear edge of the mounting means;

casing means for mounting therein said equipment module comprising:

two vertically disposed opposed walls each having a forward and a rearward pin mounted adjacent the top of the walls and spaced from each other a distance equal to the distance between the centers of the corresponding forward and rearward vertical slots, the pins further sized to fit into the corresponding forward and rearward slots, the two opposed casing walls further spaced from each other such that when the equipment module is inserted into the casing, the pins slide into their corresponding slots via the communicating open ends of the slots, each rearward pin sliding in via the open ends of the corresponding horizontal portions of the rearward slots at the rear edges of each mounting means, and each forward pin sliding in via the open ends of the corresponding horizontal portions of the forward slots at the bottom edges of each mounting means;

the closed ends of the horizontal portions of the forward and rearward slots comprising abutment means for holding the equipment module in a raised and tilted position;

the vertical portions of the forward and rearward slots comprising means for lowering or raising the equipment module vertically into or out of the casing to or from an ultimate mounted position; and

the open ends of the horizontal slots comprising further means for slidably removing the equipment module from

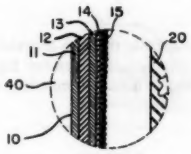
engagement with their corresponding pins and thereafter from the casing from a tilted and raised position.

4,523,255

CATHODE FOR AN ELECTROLYTIC CAPACITOR

Donald G. Rogers, Pownal, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 19, 1983, Ser. No. 533,678
Int. Cl.³ H01G *9/00*
U.S. Cl. 361—433 **7 Claims**



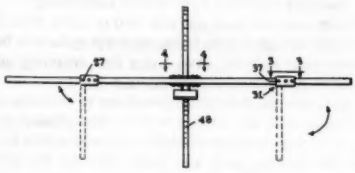
1. In a tantalum electrolytic capacitor having a porous pellet anode and a liquid electrolyte in a metal container serving as a cathode, wherein said cathode comprises a drawn composite clad can having three metal layers bonded together, one layer being tantalum and forming the interior surface of said can, an intermediate layer of copper bonded to said tantalum, and a layer of nickel bonded to said copper layer and forming the exterior surface of said can, a layer of tantalum carbide formed on said tantalum interior surface and bonded thereto, and a layer of finely-divided carbon overlying said tantalum carbide surface.

4,523,256

VARIABLE POSITION LIGHT STAND

LeRoy O. Small, 3311 NE. 97th Ave., Vancouver, Wash. 98662

Filed Nov. 8, 1983, Ser. No. 549,718
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—11 **5 Claims**



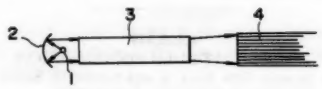
1. A portable variable position light stand comprising:
a vertically disposed elongated main shaft;
means attached to the bottom of said main shaft for selectively holding said main shaft in said vertically disposed position;
arm means for attachment to said main shaft;
light means for producing light rays;
means for attaching said light means to said arm means;
arm attaching means for adjustably vertically attaching said arm means to said main shaft; and
angle adjusting means attached to said arm attaching means for selectively adjusting the angle of said arm means with respect to said main shaft, said angle adjusting means comprising housing and spring steel means attached at one end thereof said arm means and having projection means on the other end thereof and a plurality of openings in said housing means for receiving said projection means whereby the angle of said arm means will be different upon which of said openings said projection means is disposed in, said spring steel means being for biasing said projection means towards a respective one of said openings for locking the arm means in at a desired angle and permitting said projection means to be selectively removed from a respective one of said openings for permitting pivoting of the arm means for adjusting the position of the arm means to a different angle with respect to the main shaft.

4,523,257

ARTIFICIAL LIGHT SOURCE DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,251
Claims priority, application Japan, Jan. 20, 1983, 58-7605
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—32 **10 Claims**



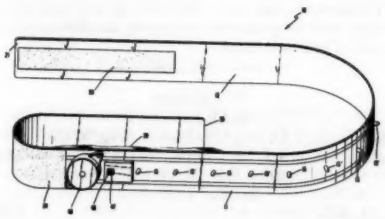
1. An artificial light source device comprising a light source lamp, a reflection mirror for converting light from said light source lamp into a parallel beam of light and reflecting said parallel beam of light, an optical conductor rod having a light-receiving edge surface and a light-discharging edge surface, said light-receiving edge surface being arranged opposite to said reflection mirror such that said parallel beam of light is guided into said optical conductor rod, and an optical conductor cable comprising a plurality of optical fibers, said cable having a light-receiving edge surface arranged opposite to said light-discharging edge surface of said optical conductor rod, the light discharged from said optical fibers being used as the light source, whereby the use of said optical conductor rod between said light source lamp and said optical conductor cable protects said light receiving edge surface of said optical conductor cable from burn-out.

4,523,258

FLEXIBLE SAFETY BELT WITH FLASHING LIGHT-EMITTING DEVICES AND ALARM

John H. Morse, 3437 Catalina Dr., Chamblee, Ga. 30341, and Robert Skrynecki, 2754 FosterRidge Rd., Atlanta, Ga. 30345

Continuation-in-part of Ser. No. 533,233, Sep. 19, 1983, abandoned. This application Mar. 29, 1984, Ser. No. 594,854
Int. Cl.³ F21L *15/14*
U.S. Cl. 362—108 **8 Claims**



1. Apparatus for increasing visibility of a wearer under conditions of low ambient light comprising in combination:
a hollow belt of flexible material characterized by a pair of ends;
fastening means connected to said pair of ends for securing said pair of ends together;
a plurality of light-emitting devices disposed in spaced apart relationship along the length of one side of said belt of flexible material and connected in a plurality of subsets of light-emitting devices;
an elongated strip of flexible circuit board enclosed with the

interior of said hollow belt, said flexible circuit board including oscillator means and connecting means for connecting said oscillator means to said plurality of light-emitting devices, whereby said light-emitting devices are caused to be intermittently lit, said oscillator means controlling which particular subset is intermittently lit while also controlling the intermittent lighting of the particular subset chosen to be intermittently lit;

further wherein an alarm means is connected to said circuit board in parallel with said light-emitting devices with respect to a power source of said circuit board; and

further including means controlling the activation of said alarm means comprising a first manually controlled on-off switch, and further including a second manually controlled on-off switch for controlling the activation of said light-emitting devices.

4,523,259

BOLT-LIGHT BULB COMBINATION

Danny R. Dorsett, U.S. Hwy. 6, and Gerald D. Smith, Jr., 355 Marian Dr., both of Valparaiso, Ind. 46383

Filed Dec. 23, 1983, Ser. No. 565,163

Int. Cl.³ B25K *23/18*

U.S. Cl. 362—120 **11 Claims**

1. A bolt and light bulb combination wherein said bolt comprises a shank having exterior threads and a head at one end of said shank, said threaded shank being the fastening element, and said head being a clamping element, said shank having a passageway longitudinally therethrough terminating in said head, and said head having a passageway through a side thereof transversely of and communicating with said longitudinal passageway in said head;

and wherein said light bulb comprises a body and wire leads, said light bulb body being positioned in said passageways at the intersection of said longitudinal and transverse passageways, and said wire leads of said bulb extending from said longitudinal passageway exterior of the other end of said bolt shank.

4,523,260

STAR DISPLAY

Freda Duncan, P.O. Box 531, Elkton, Oreg. 97436

Continuation of Ser. No. 293,149, Aug. 17, 1981, abandoned. This application Feb. 10, 1984, Ser. No. 578,312

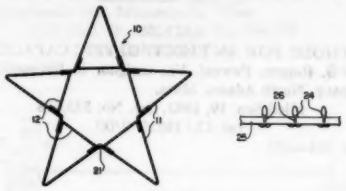
Int. Cl.³ F21P *1/02*

U.S. Cl. 362—121 **3 Claims**

1. A uniplanar star which comprises;

a plurality of identical point members formed of an opaque strap material, each said member in the shape of an open-base triangle having two sides with an outwardly extending leg at the terminus of each said side, said point members having mounted thereon a plurality of decorative lights, each said point member having a pair of holes in each of said leg portions and in each of said sides, said hole pairs for receiving fastening means therethrough;

a plurality of identical brace members, one for each point member, formed of a flat strap material and having a straight central portion with inwardly turned ends, each of said brace member ends having a pair of holes indexable with the hole pairs in said point members; and



fastening means insertable through indexed hole pairs of a point member side, a point member leg portion and a brace member end to hold said members in a rigid, parallel, superposed attitude.

4,523,261

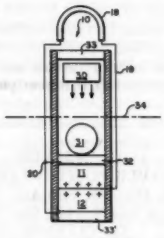
LIGHT SOURCE, MANUALLY OPERATED

Philip G. West, Rte. 3, Box 215, Orange, Va. 22960

Filed Aug. 5, 1982, Ser. No. 405,632

Int. Cl.³ H04R *17/00, 21/00*

U.S. Cl. 362—192 **1 Claim**



1. A manually operated light source comprising:

a cylinder containing at one end two or more piezoelectric crystals arranged with facing opposite polarities between a moveable metallic anvil and a first retaining anvil located at one end of the cylinder;

said moveable anvil is circular in shape to conform in close tolerance with the interior wall of the cylinder; and,

a gravity driven hammer slideably mounted within the cylinder for moving back and forth between the moveable anvil and a second retaining anvil located at the other end of the cylinder;

said cylinder fitted with electrical connection means that connect positive and negative faces of the piezoelectric crystals to a gas-filled discharge tube,

whereby the cylinder upon being rotated end for end allows the hammer to fall under force of gravity to strike the moveable anvil and cause the piezoelectric crystals to emit an electrical charge for intermittent lighting of the gas-filled tube.

4,523,262

HEADLIGHT FOR AN AUTOMOTIVE VEHICLE

Hiroaki Shinkai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 29, 1982, Ser. No. 428,193

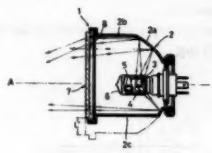
Claims priority, application Japan, Oct. 5, 1981, 56-148576[U]

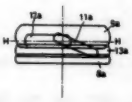
Int. Cl.³ F21M *3/14*

U.S. Cl. 362—214 **2 Claims**

1. A headlight for an automotive vehicle, the headlight comprising a concave reflector having a focusing portion, with

an optical axis and a focus on said optical axis, and a front opening, a main-beam lamp filament positioned in the vicinity of said focus on said optical axis, a low-beam filament positioned on the front side of said main-beam filament, and a lens mounted in the front opening of the reflector, wherein said lens comprises an upper lens element, an upper middle lens element arranged just below said upper lens element, a middle lens element arranged just below said upper middle lens element and consisting of a right lens member, a central lens member, and a left lens member, and a lower lens element arranged just





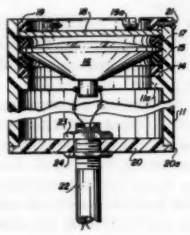
below said middle lens element, the vertical dimension of said lens below the optical axis being substantially less than the vertical dimension of said lens above the optical axis, and said upper lens element having a cross-sectional shape in elevation such that light rays from the main-beam filament that are incident thereon after reflection by the concave reflector are refracted downwardly to provide a light distribution pattern from said upper lens element that crosses, and fills in below, the light distribution patterns from said upper middle, middle, and lower lens elements under main-beam operation of the headlight.

4,523,263

OUTDOOR LIGHTING FIXTURE

David D. Poyer, 858 Roseway St., Naples, Fla. 33942

Filed Jun. 22, 1984, Ser. No. 623,319
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **6 Claims**



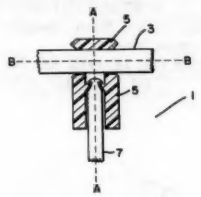
1. An electric lighting fixture for outdoor use comprising:
- a cylindrical housing made entirely of polyvinyl chloride and having concentric inner and outer walls,
- said housing having an annular ring projecting from its inner wall,
- a first flexible O-ring having an outer diameter slightly less than the diameter of the inner wall of said housing positioned against the surface of said ring,
- a low voltage electric lamp having an outer diameter slightly less than the diameter of the inner wall of said housing, the lower edge of said lamp being positioned against said first O-ring,
- a second O-ring identical to the first O-ring positioned against the upper edge of said lamp,
- a circular lens having an outer diameter slightly less than the diameter of the inner wall of said housing positioned against said second O-ring, and
- a lens retaining ring made entirely of polyvinyl chloride with an outer diameter slightly less than the diameter of the inner wall of said housing firmly pressed against the outer surface of said lens so as to cause the two flexible O-rings to seal against the inner wall of said housing and said ring being secured in position by joinder to said housing.

4,523,264

TWO-PIECE TUBE SUPPORT ASSEMBLY

Gordon M. West, Miami, Fla., assignor to West & Associates, Inc., Miami, Fla.

Filed Jan. 9, 1984, Ser. No. 569,446
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—396 **1 Claim**



1. A two-piece assembly for use in holding a tube, comprising a tube holder and support,
- said tube holder being formed of a resilient plastic and comprising a substantially cylindrical body having a hole formed along the longitudinal axis thereof, said hole having formed in the wall thereof an annular recess, and projections integral with said cylindrical body forming a bore between them substantially circular in cross section and corresponding to the tube to be held, having its longitudinal axis substantially perpendicular to the longitudinal axis of the cylindrical body; and
- said support comprising a base and a cylindrical support member formed integrally thereon, the end of the support member distal from the base having formed therein an annular projection which mates with the annular recess in the holder when the holder and support are pressed together.

4,523,265

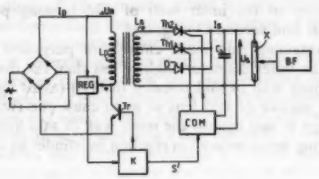
PROCESS AND DEVICE FOR ELIMINATING THE DISTURBANCES RELATED TO THE FLUCTUATIONS OF THE LOAD IN CHOPPED POWER SUPPLIES

Louis Deprez, Palaiseau, France, assignor to Compagnie de Signaux et D'Entreprises Electriques, Paris, France

Filed Jun. 29, 1983, Ser. No. 509,271
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **11 Claims**

1. A chopped voltage supply comprising: a magnetic circuit, a pair of input terminals, chopping transistor means connecting said input terminals to said magnetic circuit and arranged to operate periodically to build up magnetic energy in said magnetic circuit during an initial portion of each period of operation, said magnetic circuit including a tapped winding for transfer of energy to a load during the remaining portion of each period of operation, said winding having end terminals and a plurality of tap terminals, a pair of load terminals for connection to a load, a connection between one of said wind-

ing terminals and one load terminal and a plurality of switch elements connected between others of said winding terminals and the iother load terminal, and a voltage threshold control circuit coupled to said load terminals and coupled to said



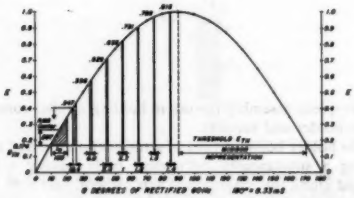
switch elements for controlling conduction of said switch elements to control the value of the inductance of said winding which is connected in series with the load and to regulate the load voltage.

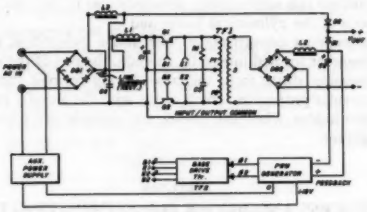
4,523,266

AC TO DC CONVERSION SYSTEM WITH CURRENT SPREADING CIRCUIT

Dale H. Nelson, Natick, Mass., assignor to Prime Computer, Inc., Framingham, Mass.

Filed Feb. 14, 1983, Ser. No. 466,331
Int. Cl.³ H02P *13/24*
U.S. Cl. 363—26 **4 Claims**





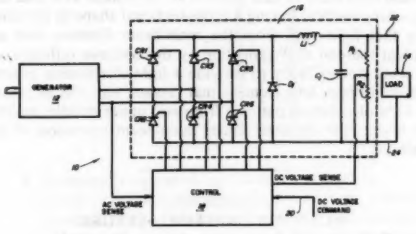
1. A current spreading circuit comprising;
input circuit means for receiving an input AC voltage and rectifying said AC voltage,
output circuit means for providing a DC output voltage,
and pulse-width-modulation means intercoupled between said input circuit means and said output circuit means and comprising means adapted to pass input AC current in pulse width increments with the pulse width varying in inverse proportion to the AC voltage,
whereby when the instantaneous AC voltage is low the pulse widths are wider and when the voltage is high the pulse widths are narrower,
said pulse-width-modulation means comprising a pulse-width-modulation (PWM) generator having feedback means responsive to output voltage, electronic switch means and drive circuit means coupled from said PWM generator to said switch means for controlling conduction of said switch means,
said drive circuit means including a base drive transformer,
said electronic switch means comprising a pair of transistors,
said pulse-width-modulation means further comprising a transformer coupled from said transistors to said output circuit means,
said transformer having a pair of primary windings and a secondary winding,
said output circuit means including an output bridge and an inductor-capacitor circuit with the capacitor functioning as a storage capacitor,
and a second inductor-capacitor circuit at the output of said means for rectifying.

4,523,267

POWER CONVERTER CONTROL CIRCUIT

Byron R. Mehl, Belvidere, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 14, 1983, Ser. No. 560,888
Int. Cl.³ H02P *13/20, 13/26*
U.S. Cl. 363—87 **15 Claims**



1. In a power converter for converting between polyphase periodic power and unidirectional power having a plurality of controllable switches, an improved means for controlling the switches, comprising:
first means for sensing a parameter of the periodic power;
a ramp generator coupled to the first means for generating a ramp signal having a frequency equal to the frequency of the periodic power;
second means for sensing a parameter representative of a condition at the output of the power converter;
means coupled to the ramp generator and to the second means for combining the outputs therefrom to generate a time-varying signal having a frequency equal to the frequency of the periodic power but shifted in time relative thereto, with the shift being dependent upon the output parameter;
a phase-locked loop coupled to the combining means for developing a PLL signal whose frequency is a multiple of the frequency of the time-varying signal, the phase-locked loop having means for generating a DC signal representing the frequency of the PLL signal, the DC signal being coupled to the ramp generator to vary the slope of the ramp signal; and
multi-phase logic means coupled between the phase-locked loop and the switches for operating the switches in accordance with the PLL signal.

4,523,268

METHOD AND CIRCUIT FOR GENERATING DRIVE PULSES FOR A DC CONTROL ELEMENT

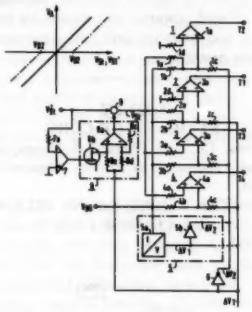
Antonio Brajder, and Klaus Hantke, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,806

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226001

Int. Cl.³ H02P *13/18*

U.S. Cl. 363—98 **7 Claims**



1. A method of generating drive pulses for a DC control element of the type having four semiconductor switches arranged in a bridge circuit, the method being of the type having the step of producing drive pulses by comparing a triangular voltage waveform with a control voltage, there being a pause between conductive states of the semiconductor switches within a bridge branch of the bridge circuit, the method comprising the further steps of:

forming first and second triangular voltage waveforms which are shifted with respect to one another by a difference voltage;

driving a first semiconductor switch of a predetermined bridge branch in response to a comparison between said first triangular voltage waveform and the control voltage; and

driving a second semiconductor switch of said bridge branch in response to a comparison of said second triangular voltage waveform with the control voltage.

4,523,269

SERIES RESONANCE CHARGE TRANSFER REGULATION METHOD AND APPARATUS

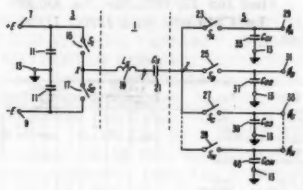
Richard H. Baker, Bedford, Mass.; David L. Chu, Summit, N.J., and Derek Chambers, Bayville, N.Y., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Nov. 16, 1983, Ser. No. 552,335

Int. Cl.³ H02M *7/515*

U.S. Cl. 363—138 **56 Claims**

1. A method of regulating a load so it has a predetermined voltage, the load being regulated with a resonant circuit selectively connected between the load and a source, the resonant circuit including a series capacitor, the load including a shunt capacitor having a value such that the load voltage remains relatively constant between adjacent exchanges of energy between the resonant circuit and to the load, comprising charging the series capacitor to a level determined by the source voltage and the voltage across the shunt capacitor, and connecting the source in series with the load and the resonant circuit while the series capacitor is charged to said level for an interval equal to one half cycle of the resonant circuit resonant frequency so current flowing between the source and the load



via the resonant circuit during the interval is zero at the beginning and end of the interval.

4,523,270

METHOD AND DEVICE FOR CREATING CURVED SURFACES

Hajimu Kishi, Hino, and Masaki Seki, Tokyo, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

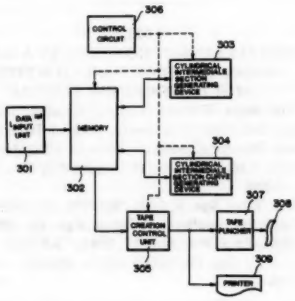
PCT No. PCT/JP81/00402, § 371 Date Aug. 23, 1982, § 102(e) Date Aug. 23, 1982, PCT Pub. No. WO82/02434, PCT Pub. Date Jul. 22, 1982

PCT Filed Dec. 23, 1981, Ser. No. 413,331

Claims priority, application Japan, Dec. 30, 1980, 55-186733

Int. Cl.³ G06F *15/46;* **G05B** *19/42*

U.S. Cl. 364—191 **13 Claims**



1. A method of generating a curved surface of a three dimensional body, comprising

providing at least two given sections and respective given section curves to include at least a first given cylindrical section and a respective first given cylindrical section curve, each said given cylindrical section having an axis parallel to a first direction,

generating a plurality of intermediate cylindrical sections so that the axis of each said cylindrical intermediate section is parallel to said first direction, and so that each said given and intermediate cylindrical section does not intersect each other, and

generating a respective intermediate cylindrical section curve in said intermediate section from said given section curves in said given sections, and from the respective radii, and any separation between the axes, of the given and intermediate cylindrical sections,

wherein, when said given sections and respective given section curves include only one given cylindrical section and one respective given cylindrical section curve, then all of said given and intermediate cylindrical sections are concentric and said given sections and respective given section curves include two reference sections and respective reference section curves.

4,523,271
SOFTWARE PROTECTION METHOD AND APPARATUS

Raphael L. Levien, Rte. 1, Box 19, McDowell, Va. 24458

Filed Jun. 22, 1982, Ser. No. 390,885
Int. Cl.[3] G06F *9/00, 13/00, 11/30*
U.S. Cl. 364—200 14 Claims

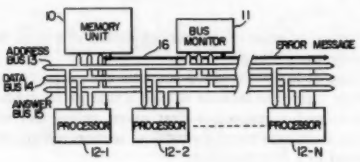
MACHINE CYCLE		STATUS			CONTROL		
		IO/M	S1	S0	RD	WR	INTA
OPCODE FETCH	(OF)	0	1	1	0	1	1
MEMORY READ	(MR)	0	1	0	0	1	1
MEMORY WRITE	(MW)	0	0	1	1	0	1
I/O READ	(IOR)	1	1	0	0	1	1
I/O WRITE	(IOW)	1	0	1	1	0	1
ACKNOWLEDGE OF INTR	(INA)	1	1	1	1	1	0
BUS IDLE	(BI):DAD ACK. OF RST, TRAP HALT	0	1	0	1	1	1
		1	1	1	1	1	1
		TS	0	0	TS	TS	1

1. In a computer having a processor unit, a memory and a bus for interfacing said processor unit and said memory, said processor unit being operative to fetch instructions and access data stored in said memory, an apparatus for protecting data stored in said memory, comprising means for applying a "read data" instruction to said processor unit, memory access means for detecting a memory access signal generated by said processor unit to access data stored in said memory in response to said instruction, monitoring means for determining whether said instruction was previously fetched from said memory and means responsive to said memory access means and said monitoring means for enabling memory access only if said instruction was previously fetched from said memory.

4,523,272
BUS SELECTION CONTROL IN A DATA TRANSMISSION APPARATUS FOR A MULTIPROCESSOR SYSTEM

Yasushi Fukunaga, Hitachi; Tadaaki Bandoh, Ibaraki; Ryosei Hiraoka; Hidekazu Matsumoto, both of Hitachi; Jushi Ide, Mito, and Tetsuya Kawakami, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,785
Claims priority, application Japan, Apr. 10, 1981, 56-52948; Apr. 10, 1981, 56-52949; Apr. 17, 1981, 56-57226
Int. Cl.[3] G06F *15/16, 15/40*
U.S. Cl. 364—200 12 Claims

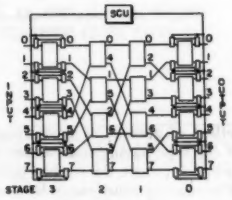


1. A data transmission apparatus for a multiprocessor system comprising at least one memory unit; a plurality of processors; synchronous common bus means including at least an address bus, a data bus and an answer bus connected between said memory unit and said processors for transferring data therebetween; and bus control means provided in each of said processors and said memory unit for controlling the use of said common bus means, said common bus means further including bus request control lines, associated with said address bus, said data bus and said answer bus and connected to the bus control means in said memory unit and each of said processors, for requesting use of a bus of said common bus means; and each said bus control means including selection means connected to said separate bus request control lines for controlling use of one or more of the buses of said common bus means by the memory unit or processor in which the selection means is provided in response to bus status signals received via said bus request control lines and bus request signals generated in the memory unit or processor in which the selection means is provided, such that a data read request is transmitted through only the address bus, a data write request is transmitted through the address bus and the data bus, a read answer is transmitted through the data bus and the answer bus and a write answer is transmitted through only the answer bus when said buses are not in use as indicated by said received bus status signals, whereby said memory unit and said processors may separately select said address bus, said data bus and said answer bus, if not in use by the memory unit or a processor, to transfer data address and answer signals to permit simultaneous use of different buses of said common bus means by more than one processor or by said memory unit and a processor for read, write and answer operations.

4,523,273
EXTRA STAGE CUBE

George B. Adams, III, and Howard J. Siegel, both of West Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed Dec. 23, 1982, Ser. No. 452,438
Int. Cl.[3] G06F *1/00*
U.S. Cl. 364—200 14 Claims

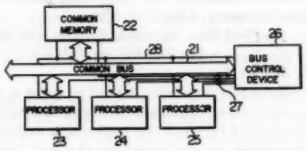


1. A multistage data routing system comprising a cube comprising a plurality of stages sequentially numbered n−1 through 0, an extra stage n situated to precede stage n−1 of the cube, extra stage n and stage 0 including means for selectively bypassing stage n or stage 0 or neither stage n nor stage 0.

4,523,274
DATA PROCESSING SYSTEM WITH PROCESSORS HAVING DIFFERENT PROCESSING SPEEDS SHARING A COMMON BUS

Yasushi Fukunaga, Hitachi, and Tadaaki Bandoh, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,644
Claims priority, application Japan, Apr. 4, 1980, 55-43496
Int. Cl.[3] G06F *15/16*
U.S. Cl. 364—200 7 Claims



1. A data processing system comprising:
(a) a plurality of processors having different processing speeds;
(b) a common bus of synchronous type with which said plurality of processors are connected;

(c) a common memory connected with said common bus and accessed by said plurality of processors through said common bus;

(d) bus control means connected with said common bus and including high-frequency master clock signal generating means for producing a master clock signal to be applied in common to said plurality of processors;

(e) each said processor including means for determining a machine cycle corresponding to the processing speed thereof by frequency-dividing said master clock signal produced by said high frequency master clock signal generating means; and

(f) wherein said bus control means comprises means including a preferential selection circuit connected to said processor and said common memory and a bus control circuit connected to said preferential selection circuit for controlling the selection of said common bus in accordance with common bus occupation demands by each of said processors and said common memory, and gate means responsive to said preferential selection circuit for controlling the operation of the bus control circuit in synchronism with the master clock signal from the high frequency master clock signal generating means.

4,523,275

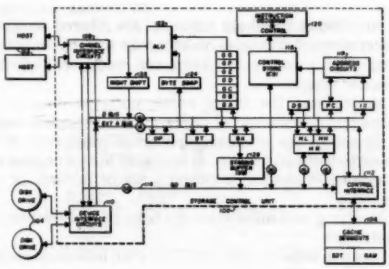
CACHE/DISK SUBSYSTEM WITH FLOATING ENTRY

Robert E. Swenson, Mendota Heights, Minn.; Lawrence D. Sasscer, and Don M. Robinson, both of San Jose, Calif., assignors to Sperry Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 207,060, Nov. 14, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 477,563

Int. Cl.³ G06F *11/00, 13/00*

U.S. Cl. 364—200 **9 Claims**



1. In a data processing system including a host processor for issuing commands, a bulk memory, a cache store for storing segments of data, a storage control unit, first means for storing a command queue and second means for storing a segment descriptor table having an entry therein corresponding to each segment of data in said cache store, said storage control unit including third means responsive to a given command from said host processor for writing data into said cache store and setting a written-to indicator in the segment descriptor table entry corrseponding to a segment of data written to in response to said given command, fourth means for searching said segment descriptor table to determine which one of the written-to segments in said cache store should be transferred to said bulk memory and forming and storing in said first means a trickle command to control said transfer, and fifth means for detecting the occurrence of an error which prevents the transfer of said one segment of data to said bulk memory, the improvement comprising:

sixth means in said storage control unit responsive to said fifth means for setting a floater indicator in the segment descriptor table entry corresponding to the segment in said cache store from which said transfer is prevented because of said error; and,

seventh means in said storage control unit responsive to said sixth means for deleting from said command queue the command formed by said fourth means.

4,523,276

INPUT/OUTPUT CONTROL DEVICE WITH MEMORY DEVICE FOR STORING VARIABLE-LENGTH DATA AND METHOD OF CONTROLLING THEREOF

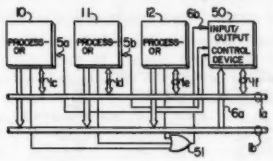
Hideo Maejima; Ikuro Masuda; Hidekazu Matsumoto, all of Hitachi, and Shyoichi Miyazawa, Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 194,226, Oct. 6, 1980, abandoned. This application Sep. 19, 1983, Ser. No. 533,803

Claims priority, application Japan, Oct. 5, 1979, 54-127958

Int. Cl.³ G06F *5/00, 13/00, 15/16*

U.S. Cl. 364—200 **18 Claims**



1. A method of controlling a data processing system for processing data having different word lengths at most equal to 2^N bits, where N is a positive integer, using a memory device which comprises a first and a second memory, the method comprising the steps of:

producing a first group of data words, in which first group at least one of the words is of different word length than the other words of the first group, each data word being at most equal to 2^N bits, producing a first signal indicating the word length 2^n of each data word of the first group, where n=0, 1, . . . , (N−1) or N, and producing a second signal specifying an address in the first memory at which each data word is to be stored;

storing the data words of the first group in the first memory at the address specified by said second signal and in such a way that data words of the same word length as indicated by said first signal are successively stored with no unused storage space intervening between adjacent stored data words;

reading out the contents of said first memory as units of a fixed word length 2^m, wherein m=0, 1 . . . (N−1) or N;

producing a second group of data words, each second group having said fixed word length 2^m;

storing the second group of data words in said second memory; and

outputting the data words stored in said second memory in the form of data words of different word length from each other and having a length at most equal to 2^N bits.

4,523,277

PRIORITY INTERRUPT SYSTEM FOR MICROCOMPUTER

Vernon K. Schnathorst, Monument, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 30, 1982, Ser. No. 429,580

Int. Cl.³ G06F *9/46, 9/32, 9/42*

U.S. Cl. 364—200 **3 Claims**

3. A priority interrupt system for a microcomputer having a program read only memory for storing service routines for servicing a plurality of peripheral devices, comprising:

program counter means for stepping through the addresses of the program read-only memory in the microcomputer;

input means for receiving interrupt request signals from the peripheral devices indicating requests for access to the microcomputer, said input means including a first set of

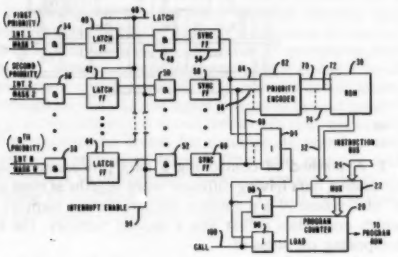
storage devices corresponding in number to the number of peripheral devices and adapted to being coupled to a second set of storage devices for actuating a control means in response to an interrupt request signal; and

enabling means coupling said first set of storage devices to a second set of storage devices to selectively enable and disable the transfer of the interrupt request signals from the first set of storage devices to said second set of storage devices:

read-only memory means for storing interrupt address jump vectors corresponding to the service routines for servicing the peripheral devices;

priority encoder means responsive to said input means for producing priority signals to select interrupt address jump vectors from said read-only memory means in accordance with a predetermined priority basis in response to the interrupt request signals from the peripheral devices;

control means responsive to said input means for transferring the contents of said program counter means into the microcomputer memory upon occurrence of an interrupt signal;



multiplex means connected between the instruction bus of the microcomputer and said program counter means and operated by said control means in response to an interrupt request signal for coupling said read-only memory means to said program counter means to receive the corresponding interrupt address jump vectors therefrom;

a second set of storage devices corresponding in number to the number of peripheral devices coupled to said enabling means and responsive to the interrupt request signals from different peripheral devices; and

means for latching at any selected time said sets of storage devices to store the interrupt request signals therein while the corresponding interrupt address jump vectors are loaded in sequence into said program counter means to allow the peripheral devices requesting access to be serviced on the predetermined priority basis.

4,523,278

METHOD OF AUTOMATIC DETECTION OF CELLS AND DETERMINATION OF CELL FEATURES FROM CYTOLOGICAL SMEAR PREPARATIONS

Erich Reinhardt, and Rainer Erhardt, both of Stuttgart, Fed. Rep. of Germany, assignors to Prof. Dr.-Ing. Werner H. Bloss, Fed. Rep. of Germany

Continuation of Ser. No. 392,590, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 117,515, Feb. 1, 1980, abandoned. This application Jun. 7, 1984, Ser. No. 618,447

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903855

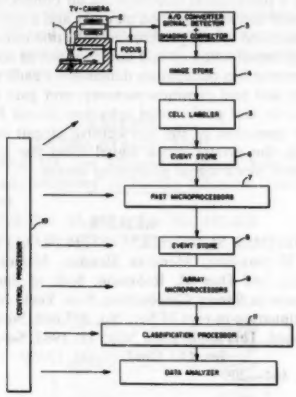
Int. Cl.³ G06F *15/42*

U.S. Cl. 364—413 **17 Claims**

1. A method for automatic classification of cells and determination of cell features from cytological smear preparations, on the basis of an original television image displaying a plurality of cell nuclear images, obtained by means of a television camera, wherein only the cell nuclei are used for evaluation, while irrelevant structures displayed in said original image are ignored, and wherein said classification and determination is based on a feature set consisting of topological parameters of the boundaries of said nuclei as displayed both in the original image and in one or more transformed images, the steps comprising

(a) storing the original television images in memory as an array of image point gray scale values;

(b) filtering the original images to suppress the scale values representing irrelevant structures, including structures beneath a predetermined size, thus obtaining filtered and transformed images;



(c) establishing threshold values of the filtered images to determine relative gray value peaks thereby smoothing and simultaneously localizing cell nuclei as individual nuclear images;

(d) determining the image points corresponding to the boundary of a nucleus as displayed in said nuclear image;

(e) measuring one or more topological parameters of the boundary of said nucleus, as displayed in said original and transformed images, to obtain a set of features of said nucleus;

(f) classifying said nucleus on the basis of said features set; and

(g) repeating steps (c) through (f) for each individual nuclear image in said filtered image.

4,523,279

APPARATUS FOR DETERMINING OXYGEN SATURATION LEVELS IN BLOOD

Johnie M. Sperinde, San Jose; Stanley D. Goldring, Cupertino, and Dean T. Miller, Portola Valley, all of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Continuation of Ser. No. 210,032, Nov. 24, 1980, Pat. No. 4,453,218. This application Jun. 4, 1984, Ser. No. 616,817

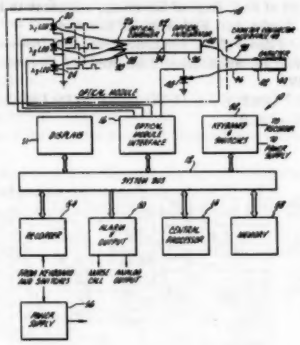
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.³ A61B *5/04*

U.S. Cl. 364—416 **8 Claims**

1. An apparatus for determining oxygen saturation levels in blood comprising means for generating electromagnetic radiation at a plurality of different wavelengths, means coupled to said generating means for transmitting said electromagnetic radiation at each of said plurality of different wavelengths to the blood and for receiving electromagnetic radiation reflected back from the blood at each of said plurality of different wavelengths in response to said electromagnetic radiation so transmitted, a detector coupled to said receiving means for generating a plurality of signals respectively having values which vary in proportion to the intensities of said electromagnetic radia-

tion received at each of said plurality of different wavelengths, means for monitoring said signals from said detector ro determine short time intervals when said signals increase substantially in value to indicate that said receiving means is receiving



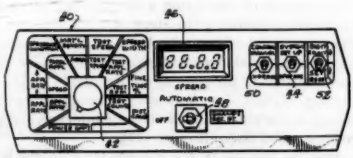
reflections from other than solely said blood, means for negating the effect of the signals received during said short time intervals, and means connected to receive said signals for generating an oxygen saturation output signal as a function of said signals except for the negated signals.

4,523,280

SPREADER CONTROL

Wesley J. Bachman, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Feb. 24, 1983, Ser. No. 469,205
Int. Cl.³ G06F *15/20;* **B05B** *9/06*
U.S. Cl. 364—424 **12 Claims**



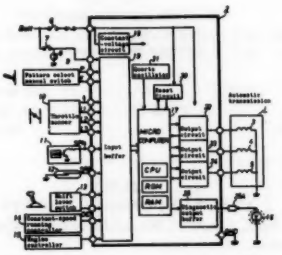
1. An improvement in a control system for a mobile material distribution apparatus including ground speed sensor means for developing a signal corresponding to the ground speed of the mobile apparatus, distributing means for spreading said material along the path of travel of the mobile apparatus, variable rate delivery means for delivering material at a controllably variable rate to said distributing means, delivery rate sensor means for developing a signal corresponding to the actual rate of delivery of material to said distributing means, and desired distribution rate control means for developing a signal corresponding to a desired distribution rate of material per unit area; said control system comprising: calculating circuit means responsive to said ground speed signal, to said actual delivery rate signal and to said desired distribution rate signal for periodically calculating a desired delivery rate of material to the distributing means necessary to achieve said desired distribution rate and for periodically calculating the difference between said desired delivery rate and said actual delivery rate and developing a corresponding difference signal; and control signal producing means responsive to each said difference signal for developing a control signal; said variable rate delivery means being responsive to said control signal for varying the delivery rate of material to said distributing means in the amount necessary to achieve said desired material delivery rate, so as to achieve and thereafter maintain said desired distribution rate; the improvement comprising: said control signal producing means further including means responsive to values of said differences signal within a predetermined range of values for developing said control signal as a cyclical signal having a duty cycle which varies in a predetermined fashion in accordance with the value of said difference signal; and means responsive to values of said difference signal which are below said predetermined range of values for accumulating said periodically developed difference signals until the sum of the values of the accumulated difference signals is within said predetermined range of values and for thereafter developing said cyclical, variable duty cycle control signal in accordance with the value of said sum.

4,523,281

AUTOMATIC TRANSMISSION CONTROLLER FOR AUTOMOBILES

Munetaka Noda, Chiryu; Yukio Tobe, Kariya; Yutaka Taga; Shinya Nakamura, both of Toyota; Kazumasa Nakamura, Okazaki; Takafumi Inagaki, and Hiroshi Ito, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 21, 1982, Ser. No. 400,402
Claims priority, application Japan, Jul. 23, 1981, 56-115701
Int. Cl.³ F16H *5/66;* **B60K** *41/06, 41/22;* **G06F** *15/20*
U.S. Cl. 364—424.1 **5 Claims**



1. An electronic automatic transmission control system for an automobile comprising:

speed sensor means for producing a speed signal indicative of a running speed of the automobile;

load sensor means for producing a load signal indicative of an engine load;

manually operable mode selecting means for selecting any one of power, normal and economy modes;

shift solenoid means for controlling shift of the automatic transmission;

lock-up solenoid means for controlling lock-up of the automatic transmission;

memory means for storing a plurality of shift patterns and lock-up patterns in relation to the running speed and the engine load; and

processor means for selecting one of said shift patterns and one of said lock-up patterns in accordance with the mode selected by said mode selecting means, said processor producing a solenoid control signal for said shift solenoid means and said lock-up solenoid means based on the selected shift pattern and the selected lock-up pattern, respectively, in response to said speed signal and said load signal.

4. An electronic automatic transmission control system for an automobile comprising:

speed sensor means for producing a speed signal indicative of a running speed of the automobile;

load sensor means for producing a load signal indicative of an engine load;

solenoid means including a plurality of solenoids for controlling shifts and lock-up of said automatic transmission;

output circuit means connected to said solenoids for controlling the operation of said solenoids and producing solenoid state signals indicative of operating states of said solenoids; and

programmed computer means connected to said speed sensor means, said load sensor means and said output circuit means and having a memory which stores a predetermined shift pattern and a lock-up pattern in relation to the running speed and the engine load,

said computer means normally producing solenoid control signals applied to said output circuit means to control said solenoids in response to said speed signal and said load signal and based on said shift pattern and said lock-up pattern,

said computer means detecting failure of said solenoids in response to said solenoid control signals produced therefrom and said solenoid state signals produced from said output circuit means and further changing said solenoid control signals upon detection of the solenoid failure so that the shift or lock-up condition of the automatic transmission caused by the solenoid failure is disabled and is changed to a different shift or lock-up condition.

4,523,282

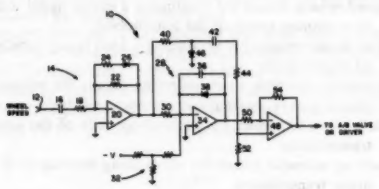
ANTISKID CONTROL CIRCUIT

Arnold A. Beck, Clinton, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 8, 1982, Ser. No. 355,502

Int. Cl.³ B60T *8/08*

U.S. Cl. 364—426 **9 Claims**



1. An antiskid control circuit, comprising:

a deceleration detector, receiving an input signal corresponding to the instantaneous speed of a wheel and generating therefrom a deceleration signal;

modulation means connected to and receiving said deceleration signal from said deceleration detector for generating a brake control signal therefrom dependent upon rotational activity of the wheel; and

said deceleration detector including gain selection means for changing the output gain of said deceleration detector as a function of said rotational activity of the wheel, said gain selection means providing a first gain to said deceleration detector during periods in which the wheel accelerates and a second gain during periods in which the wheel decelerates, said first gain being lower than said second gain.

4,523,283

SERVICE-INTERVAL DISPLAY FOR MOTOR VEHICLE AND CIRCUIT FOR A DISPLAY OF THIS TYPE

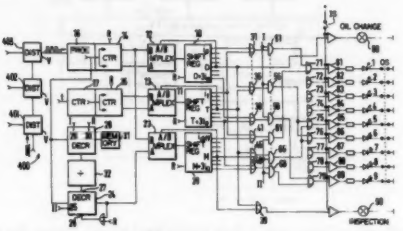
Heinz Muhlberger, Eching; Erwin Starmuhler, Munich; Walter Weishaupt, Munich; Peter Flohr, Munich, and Fritz Bourauel, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,765

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104197

Int. Cl.³ G06F *3/14, 15/20;* **G08B** *5/36;* **G07C** *5/08*

U.S. Cl. 364—431.01 **47 Claims**



42. Apparatus for a service-interval display for a motor vehicle comprising

first means for visually indicating service intervals,

a first shift register means for generating an output signal representing distance traveled by the vehicle and supplied with an input signal when a fixed distance (i_d) is traveled by the vehicle,

a second shift register means for generating an output signal representing time elapsed and supplied with an input signal when a fixed time interval (i_t) has elapsed,

gating means controlling the first means in accordance with the output signals of the first and second shift registers.

47. The method of displaying a service-interval display for motor vehicles comprising the steps of

sensing movement of the vehicle to produce a signal,

modifying the signal in accordance with an engine operating characteristic, to produce clock signals,

generating signals for indicating the distance traveled through a plurality of fixed distance intervals (i_d) within a predetermined fixed distance (D),

indicating the passage of the vehicle through the fixed distance intervals in response to said generated signals,

eliminating the indication representing passage of the vehicle through a fixed distance interval when the vehicle passes to a succeeding fixed distance interval and

indicating that the predetermined distance (D) has been traversed.

4,523,284

METHOD OF CONTROLLING INTERNAL COMBUSTION ENGINE

Matsuo Amano; Shinichi Sakamoto, both of Hitachi; Masayuki Miki, Katsuta; Takao Sasayama, Hitachi; Seiji Suda, Mito; Yasunori Mouri, and Toshio Ishii, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 215,671

Claims priority, application Japan, Dec. 25, 1979, 54-169919

Int. Cl.³ G06F *15/20;* **G05B** *15/02;* **F02B** *3/12;* **F02D** *5/02*

U.S. Cl. 364—431.12 **45 Claims**

1. A method of controlling an internal combustion engine system which comprises an internal combustion engine in which an air-fuel mixture prepared from air introduced through an intake air passage and fuel fed from fuel supply means is subjected to combustion to produce thermal energy which is converted into mechanical energy for rotating an output shaft of said engine, while exhaust gas resulting from

the combustion is discharged through an exhaust gas passage; an air flow sensor for producing an output signal representative of the state of intake air flow within said intake air passage of said engine; and an arithmetic circuit for producing a control signal for driving said fuel supply means in dependence on the output signal from said air flow sensor;

said method comprising the steps of:

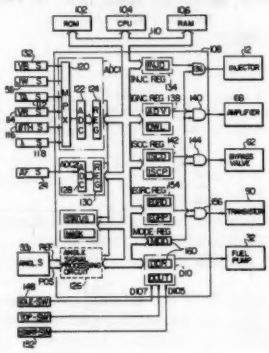
arithmetically determining the quantity of air charged to said engine on the basis of the output signal from said air flow sensor;

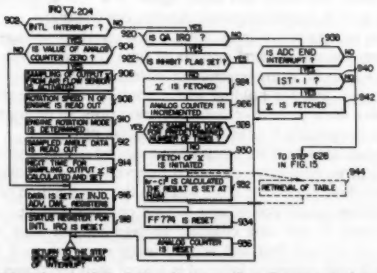
generating said control signal on the basis of the result of said arithmetic determination;

driving said fuel supply means in dependence on said control signal;

wherein said step of arithmetically determining the air quantity charged to said engine comprises:

a first step of generating data representative of a sensor





signal sampling timing for sampling the output signal from said air flow sensor in synchronism with pulsation of the air flow fed to said engine;

a second step of producing a timing signal for sampling said sensor output signal on the basis of said data representative of the timing for sampling sensor output signal;

a third step of sampling the output signal from said air flow sensor in accordance with said timing signal produced at said second step; and

a fourth step of determining the intake air quantity on the basis of a number of the signal values sampled at said third step.

7. A method of controlling an internal combustion engine system having an internal combustion engine in which an air-fuel mixture prepared from air introduced through an intake air passage and fuel fed from fuel supply means is subjected to combustion by air-fuel mixture ignition means to produce thermal energy which is converted into mechanical energy for rotating an output shaft of said engine, while exhaust gas resulting from the combustion of fuel is discharged through an exhaust gas passage, an air flow sensor for producing an output signal representative of the state of intake air flow within said intake air passage of said engine, which signal varies in synchronism with the rotation of the output shaft of said engine, and a signal processing device for producing a control signal for driving said fuel supply means and said air-fuel mixture ignition means in response to an interrupt signal and in accordance with the output signal from said air flow sensor,

said method comprising the the steps of:

(a) sampling the output signal produced by said air flow sensor a plurality of times for the generation of each interrupt signal and in synchronization with the variation of said intake air flow, so as to be in synchronization with the angle of rotation and dependent upon the rate of rotation of said output shaft,

(b) supplying a prescribed plurality of data representative of the plurality of samples of the output signal sampled in step (a) to said signal processing device, and

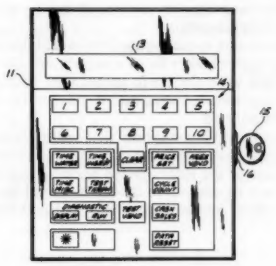
(c) producing said control signal in accordance with the average value of said prescribed plurality of data representative of said plurality of said samples of said output signal supplied in step (b), whereby said control signal for driving said fuel supply means and said air-fuel mixture ignition means is produced in accordance therewith.

4,523,285

VENDOR CONTROLLER

William W. Hendrickson, and Theodore B. Boerding, both of St. Charles, Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Oct. 22, 1981, Ser. No. 313,813
Int. Cl.³ G06F *15/20*; G07F *11/00*
U.S. Cl. 364—479 **28 Claims**



1. For a vendor for vending a plurality of items, a controller comprising:

a memory for electronically storing numeric information associated with the vending of items, said information being divided into a number of categories which are subdivided into units;

a set of manually operable selectors, one selector for each category of information;

an alphanumeric display; and

logic means interconnected with said memory, said manually operable selectors and said alphanumeric display and responsive to actuation of the selectors for retrieving from the memory one unit of vending information from the category corresponding to the actuated selector for each actuation of the selector and supplying said one unit of vending information to the alphanumeric display to display a multi-character alphanumeric designation identifying the particular information unit retrieved and a number representing the numeric value of that information unit, said logic means being responsive to repeated actuations of the corresponding selector to retrieve from said mem-

ory and display on said alphanumeric display the designations and numeric values for all units of a given category.

4,523,286

APPARATUS FOR MAKING DIAGNOSIS OF VALVE DEVICE IN TURBINE SYSTEM

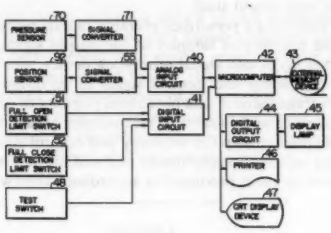
Tsugnaki Koga; Hidesumi Kuwashima; Hidenori Inoue; Hidetoshi Hamaoka, and Hiroshi Ohta, all of Hitachi, Japan, assignors to Hitachi, Ltd.; Hitachi Engineering Co. and Hitachi Service Engineering Co., Ltd., all of Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,350

Claims priority, application Japan, Aug. 7, 1981, 56-122972; Aug. 7, 1981, 56-122973

Int. Cl.³ F16K *37/00*

U.S. Cl. 364—494 **12 Claims**



1. A diagnostic apparatus for diagnosing a state of a valve device in a turbine system, said apparatus comprising:

first sensor means for sensing the state of operation of said valve device;

second sensor means to sense that said valve device is in a fully open position;

third sensor means to sense that said valve device is in a fully closed position;

processing means connected to said first sensor means and to judge whether there is any abnormality in the operation of said valve device in accordance with the output from said first sensor means and to display the result of the judgement; and

means for interrupting the operative connection between said first sensor means and said processing means when one of the fully opened position and the full closed position of said valve device is sensed by one of said second sensor means respectively and said third sensor means.

4,523,287

METHOD FOR EXTRAPOLATING A PATH OF A ROBOT AND APPARATUS THEREFOR

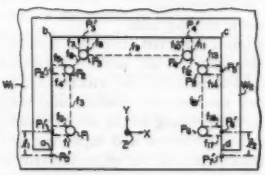
Takashi Kogawa, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,846

Claims priority, application Japan, Mar. 20, 1981, 56-39436

Int. Cl.³ G05B *19/46*

U.S. Cl. 364—513 **10 Claims**



1. A method of path control for a robot having means for detecting a boundary of a workpiece, said method comprising the steps of: setting a plurality of detecting points in proximity to the workpiece; detecting the locations of a plurality of boundary reference points on the workpiece boundary relative to respective ones of the detecting points; computing an extrapolated point arithmetically, which is disposed on an extension of a particular line extending through an adjacent pair of detected boundary reference points, the extrapolated point being spaced from the nearer one of the adjacent pair of detected boundary reference points by a predetermined length; and controlling a robot manipulator to pass along a path through the extrapolated point and the adjacent pair of detected boundary reference points.

4,523,288

INTERVAL-EXPANDING TIMER

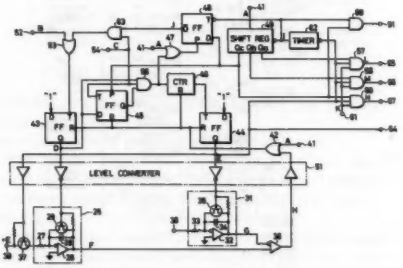
Mishio Hayashi, Saitama, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,730

Claims priority, application Japan, Mar. 16, 1981, 56-37448

Int. Cl.³ G04F *10/04*

U.S. Cl. 364—569 **17 Claims**



14. A timer, for measuring a time interval ΔT between the occurrence of an input signal supplied thereto and the first clock pulse following said input signal of a first clock signal having period T_0 also supplied thereto, comprising:

a first integrator for integrating a first constant voltage for three successive first periods of time $\Delta T+nT_0$, nT_0 and $(n+1)T_0$ in a predetermined order, n being a positive integer, and for holding and outputting each integrated value for a respective holding period prior to performing the integration for the next first period of time;

a second integrator for integrating a second constant voltage for three respective expanded intervals corresponding to said three periods of time, wherein the combination of the relative magnitude of said second constant voltage with respect to said first constant voltage and the time constants of said first and second integrators are such that each said expanded interval is longer than the respective first period;

coincidence signal means supplied successively with respective pairs of said integrated values from said first and second integrators for corresponding one of said first periods of time and expanded intervals, for outputting a coincidence signal when the output of said second integrator equals the respective integrated value that is being held by said first integrator;

a second clock for providing second clock pulses;

counting means for counting said second clock pulses during each said expanded interval; and

control means for controlling said first and second integrators to perform said integrating, so as to output from said first integrator the integrated value held therein and the respective output of said second integrator to said coincidence means for detecting said coincidence;

wherein said time interval ΔT is determined using the count values of the counting means corresponding to said three

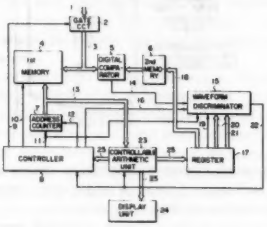
respective periods of time in the formula $((\Delta T+nT_0)-nT_0)/((n+1)T_0-nT_0)$.

4,523,289

TIME INTERVAL MEASURING SYSTEM

Masafumi Soma, Fussa, and Yoshihiko Kohno, Kokubunji, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 217,463, Dec. 17, 1980, abandoned. This application Jan. 17, 1983, Ser. No. 458,469
Claims priority, application Japan, Dec. 27, 1979, 54-169456
Int. Cl.³ G01R *23/02*
U.S. Cl. 364—569 **4 Claims**



1. A time interval measuring system comprising:

an N-bit input terminal for receiving a series of digital quantities represented by N bits and sampled at equal time intervals;

a first memory connected to the N-bit input terminal for storing the series of digital quantities;

at least one N-bit digital comparator means for comparing with each other two digital quantities respectively representing the output from the first memory and a threshold level;

means for storing the series of digital quantities in the first memory,

means for reading out the series of digital quantities from the first memory for input to the digital comparator means,

a second memory formed by an N-bit register having its output connected to the digital comparator means for storing the threshold value, means for storing data in the second memory,

at least one waveform discriminator connected to the digital comparator means and operative to remove small time deviations in the compared output near the threshold level and to generate a coincidence signal when the number of slopes crossing with the threshold level reaches a predetermined number; and

means for selecting two different addresses of the first memory when said coincidence signal is generated for a distinct set of the threshold value, the polarity and the number of slopes, and for measuring from a difference between said two addresses of the first memory, at a high speed, a time interval between two digital quantities in the first memory.

4,523,290

DATA PROCESSOR ARCHITECTURE

Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

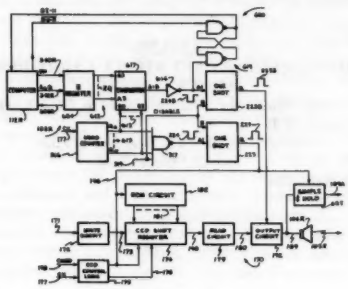
Continuation-in-part of Ser. No. 490,816, Jul. 22, 1974, Pat. No. 4,209,853, Ser. No. 522,559, Nov. 11, 1974, Pat. No. 4,209,852, and Ser. No. 812,285, Jul. 1, 1977, Pat. No. 4,371,953. This application Oct. 25, 1977, Ser. No. 844,765
Int. Cl.³ G06J *1/00*
U.S. Cl. 364—602 **63 Claims**

1. A data processor system comprising:

an analog memory for storing a program, said analog memory including means for storing the program as a plurality of analog signals;

analog refresh circuitry for refreshing the analog signals stored in said analog memory;

accessing circuitry for accessing the program of stored analog signals from said analog memory; and



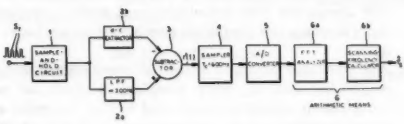
a stored program digital data processor for processing data under control of the program of stored analog signals accessed from said analog memory with said accessing circuitry.

4,523,291

DEVICE FOR ESTIMATING THE OPERATING FREQUENCY OF A SOURCE OF RECURRENT SIGNALS

Marco Giubbolini, and Walter Marziali, both of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Jun. 24, 1982, Ser. No. 391,869
Claims priority, application Italy, Jun. 25, 1981, 48762 A/81
Int. Cl.³ G06F *15/31*; G01R *23/16*
U.S. Cl. 364—724 **4 Claims**



1. A device for estimating the operating frequency of a source of current incident signals lying within a predetermined frequency range, comprising:

input circuitry for receiving an incident signal;

filter means connected to said input circuitry for isolating an a-c component of said incident signal;

sampling means connected to said filter means for deriving a sequence of amplitude pulses of predetermined cadence, corresponding to twice the upper limit of the frequency range of the incident signal, from said a-c component;

conversion means connected to said sampling means for digitizing said amplitude pulses; and

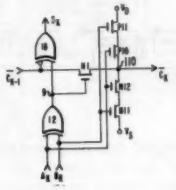
arithmetic means including an FFT analyzer, said arithmetic means being connected to said conversion means for subjecting the sequence of digitized amplitude pulses to a Fourier analysis and calculating an estimated operating frequency of said source from the index derived from selected terms in the resulting Fourier series having real and imaginary coefficients whose absolute values add up to a maximum numerical value in said series, said arithmetic means further including calculating means, connected to said FFT analyzer for weighting said index and means for deriving a corrective value from averaged differences between the Fourier coefficients of a limited number of

terms preceding and succeeding said selected terms in said series connected to said calculating means for weighting said index with the corrective value as thus derived, said calculating means being also provided with means for summing the real and imaginary coefficients of at least a number of terms of said Fourier series and comparing the resulting sums for determining the selected terms from the highest sum of said series.

4,523,292
COMPLEMENTARY FET RIPPLE CARRY BINARY ADDER CIRCUIT

John Armer, Middlesex, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1982, Ser. No. 429,328
Int. Cl.³ G06F *7/50*
U.S. Cl. 364—786 **1 Claim**



1. A binary ADDER stage for producing the sum of two single bit binary numbers and the complement of a single bit binary carry signal and providing the complement of a carry output signal associated with said sum, comprising:

first and second binary input terminals;

a sum output terminal;

a carry complement input and a carry complement output terminal;

an exclusive OR gate having first and second input terminals connected to the first and second binary input terminals respectively, and having an output terminal;

an exclusive NOR gate having first and second input terminals connected respectively to said carry complement input terminal and the output terminal of the exclusive OR gate;

a first transistor having a principal conduction path connected between the carry complement input and carry complement output terminals and having a control electrode connected to the output terminal of said exclusive OR gate;

first and second P-type transistors serially connected between the carry complement output terminal and a point of relatively positive supply potential and having respective control electrodes connected to the first and second binary input terminals respectively; and

third and fourth N-type transistors serially connected between the carry complement output terminal and a point of relatively negative supply potential and having respective control electrodes connected to the first and second binary input terminals respectively.

4,523,293
TWO-DIMENSIONAL BULK ACOUSTIC WAVE CORRELATOR-CONVOLVER

Bert A. Auld, Menlo Park; Donald W. Pettibone, Cupertino, and James D. Plummer, Mountain View, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 5, 1983, Ser. No. 482,377
Int. Cl.³ G06G *7/00;* **G06C** *7/195*
U.S. Cl. 364—821 **10 Claims**

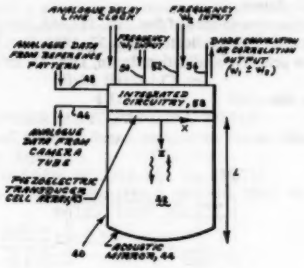
1. A two-dimensional bulk acoustic wave correlator-convolver comprising:

a cylindrical rod having a first and a second end surface,

said first end surface being planar and perpendicular to the longitudinal axis of said rod,

a piezoelectric disc having one side thereof affixed to the external portion of said first end surface of said rod, and

an integrated circuit multiplexing means attached to the other side of said piezoelectric disc,



said integrated circuit multiplexing means including electrodes defining a matrix of addressable transducer cells in said piezoelectric disc,

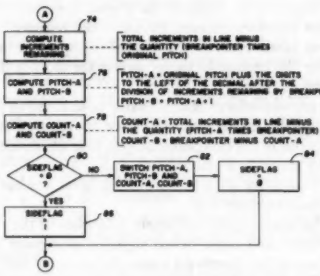
said second end surface of said rod being convex to form an acoustic mirror for reflecting acoustic waves originating at said piezoelectric disc and propagated through said rod,

said rod having a length equivalent to twice the focal length of said acoustic mirror.

4,523,294
CHARACTER SPACED JUSTIFICATION METHOD AND APPARATUS

Bryan D. C. Winn, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed May 27, 1982, Ser. No. 382,630
Int. Cl.³ B41J *19/00;* **G06F** *5/00, 9/16*
U.S. Cl. 364—900 **4 Claims**



1. A method of operating a printwheel type letter quality printer for producing character spaced justified text with aid of a microprocessor comprising:

providing a data base for said letter quality printer to said microprocessor including at least,

an original pitch increment "P(O)", and

positions at which margins are set on said letter quality printer, said microprocessor using said positions to determine total increments in a line of text "T";

serially receiving a string of characters for a line of text into an interface from a terminal;

counting each character of said string of characters in counting means of said microprocessor as each said character enters said interface;

recording in recording means of said microprocessor an

increment position of delimiters "B" at spaces or hyphens as said string of characters are counted by said counting means;

deleting said increment position from said recording means and substituting a new increment position for said delimiter "B" at each new space or hyphen as said string of characters is counted by said counting means;

comparing in comparing means of said microprocessor number of said characters of said line of text received with said text "T" to determine if enough of said characters have been received to form an intermediate line of text for justification, said comparing being repeated after receipt of each said character by said comparing means;

feeding said intermedite line of text up to a last of said delimiters "B" from said microprocessor to a random access memory for storage of said intermediate line of text when said intermediate line of text has been accumulated in said microprocessor;

calculating from said original pitch increment "P(O)" in said microprocessor number of increments "R" required to complete a justified line of text from said last of said delimiters "B" after said storage of said intermediate line of text;

first computing from said original pitch increment "P(0)" and increment "R" in said microprocessor a first pitch "P(1)" representing pitch to which said letter quality printer is set by said microprocessor for a first part of said justified line of text;

second computing from said original pitch increment "P(0)" and increment "R" in said microprocessor a second pitch "P(2)" representing pitch to which said letter quality printer is set by said microprocesor for a second part of said justified line of text;

activating said letter quality printer by said microprocessor to print said justified line of text from said random access memory when said first pitch "P(1)" and second pitch "P(2)" have been computed; and

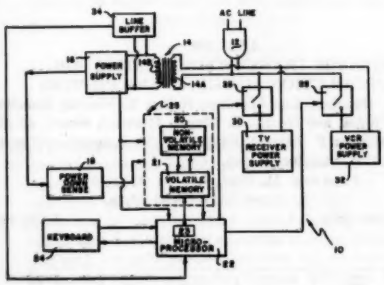
repeating said serially receiving, counting, recording, deleting, comparing, feeding, calculating, first computing, second computing and activating steps for each subsequent line of text.

4,523,295

POWER LOSS COMPENSATION FOR PROGRAMMABLE MEMORY CONTROL SYSTEM

Thomas J. Zato, Palatine, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 7, 1982, Ser. No. 415,309
Int. Cl.³ G06F 1/00
U.S. Cl. 364—900 **10 Claims**



1. In an arrangement for controlling a programmable device energized by an AC source, said arrangement including a DC power supply coupled to said AC source for generating a DC output voltage, clock means coupled to said AC source for generating real time data, programming means responsive to user-initiated inputs for generating program time data, a controller energized by said DC power supply and coupled to said programmable device, to said programming means for receiving said program time data therefrom and to said clock means for receiving said real time data therefrom, and wherein is stored a time-based control program for controlling said programmable device in accordance with said program time data referenced to said real time data, and a volatile memory coupled to said controller for temporarily storing said program and real time data during the execution of said time-based control program, a power loss protection system comprising:

power sense means coupled to said volatile memory and to said DC power supply, said power sense means comprising means for developing first control signal and capacitive means for developing second control signals respectively representing the present and a previous output voltage of said DC power supply and comparison means for comparing said first and second control signals for generating and providing to said volatile memory a write instruction when said first control signal drops below said second control signal and a read instruction when said first control signal rises above said second control signal; and

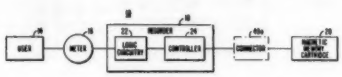
a nonvolatile memory coupled to said volatile memory for receiving and storing said program and real time data when said volatile memory receives a write instruction and for transferring said program and real time data to said volatile memory when said volatile memory receives a read instruction for later recall by said controller in resuming control of said programmable device in accordance with said time-based control program following an interruption in the output of said DC power supply, wherein the operation of said programmable device is shifted in time by an interval equal to the duration of the interruption of said power supply.

4,523,296

REPLACEABLE INTERMEDIATE SOCKET AND PLUG CONNECTOR FOR A SOLID-STATE DATA TRANSFER SYSTEM

Jerry V. Healy, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 3, 1983, Ser. No. 455,435
Int. Cl.³ G01D 9/00
U.S. Cl. 364—900 **4 Claims**



1. A solid-state data transfer system, comprising:

a controller means for receiving a train of pulses, said train of pulses being convertible into a preselected digital data format, said controller means having a terminal portion with a first set of two female sockets, said first set of two female sockets being partially enclosed by a first chamber;

a cartridge having a solid-state memory device contained within, said cartridge having a first set of two prongs connected in electrical communication with said solid-state memory device, said first set of two prongs being partially enclosed by a second chamber, said second chamber extending beyond the distal ends of each of said two prongs of said first set of two prongs, said second chamber being shaped to receive said first chamber in sliding association, said first set of two prongs being shaped to be received in interference relation by said first set of two female sockets simultaneously with said first chamber being received by said second chamber; and

an intermediate connector having a socket member and a prong member, said socket member having a second set of two female sockets and a third chamber, said second set of

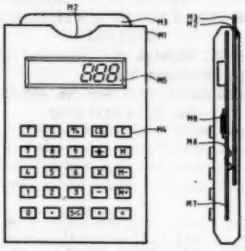
two female sockets being partially enclosed by said third chamber, said third chamber being shaped to be received by said second chamber in sliding relation, said second set of two female sockets being shaped to receive said first set of two prongs in interference relation simultaneously with said third chamber being received by said second chamber, said prong member having a second set of two prongs and a fourth chamber, said second set of two prongs being partially enclosed by said fourth chamber, said fourth chamber extending beyond the distal ends of each of said two prongs of said second set of two prongs, said fourth chamber being shaped to receive said first chamber in sliding association, said second set of two prongs being shaped to be received in interface relation by said first set of two female sockets simultaneously with said first chamber being received by said fourth chamber, said socket member and said prong member being rigidly attached together, each one of said two female sockets of said second set of two female sockets being connected in electrical communication with a preselected one of said two prongs of said second set of two prongs.

4,523,297

HAND-HELD PROCESSOR WITH TWO-WAY DIALOG BETWEEN MICROPROCESSOR IN CASE AND MICROPROCESSOR ON CARRIER INSERTABLE INTO CASING SLOT

Michel Ugon, Maurepas, and Jean-Pierre Nonat, Maule, both of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Continuation of Ser. No. 546,588, Oct. 28, 1983, abandoned, which is a continuation of Ser. No. 262,606, May 11, 1981, abandoned. This application Sep. 7, 1984, Ser. No. 648,607
Claims priority, application France, May 30, 1980, 80 012109
Int. Cl.³ G06F *15/16, 3/00*
U.S. Cl. 364—900 **9 Claims**



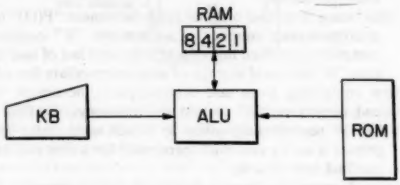
1. A portable hand-held data processor comprising a case sized to enable the case to be hand-held, the case having thereon a keyboard for manual data entry and a display, and having a slot therein for receiving a removable carrier; first processing means including a first microprocessor and a first memory disposed within the case and connected to the keyboard and to the display for performing a first predetermined set of data processing operations; a removable carrier received within the slot and releasably connected electrically to the first processing means, the removable carrier comprising a card embodying therein second processing means including a second microprocessor and a second memory for performing a second predetermined set of data processing operations; and means for the bidirectional transmission of messages in bit serial form between the first and second processing means by variations of a signal on a single conductor line connecting the first processing means to the second processing means of the removable carrier received in the slot, the first and second memories embodying programs for controlling the first and second microprocessors so as to afford bidirectional communication therebetween over said single conductor line and to expand the data processing capability of the portable data processor to enable the portable data processor to perform both said first and second predetermined sets of data processing operations.

4,523,298

INPUT DEVICE WITH A KEYBOARD IN WHICH ACTUATION OF A KEY MORE THAN ONCE MAY CAUSE A DIFFERENT FUNCTION TO BE PERFORMED

Atsushi Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 133,504, Mar. 24, 1980, abandoned. This application May 31, 1983, Ser. No. 498,677
Claims priority, application Japan, Mar. 28, 1979, 54-35429
Int. Cl.³ G06F *15/02*
U.S. Cl. 364—900 **14 Claims**



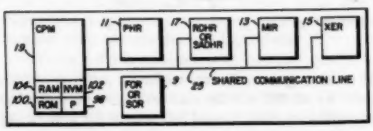
1. An input device, comprising:
keyboard means having a plurality of input keys, at least one of said input keys being assigned more than one function and the actuation of said one input key more than once in a sequence of actuations performing a function different from that performed by the first actuation thereof;
first memory means for storing status data for said one input key;
second memory means for storing next status data for replacing the status data in said first memory means; and
process means for generating input information as a function of a combination of the status data from said first memory means and actuation of said one input key from among said plurality of input keys,
said process means supplying the next status data in said second memory means to said first memory means in accordance with the combination of the operated input key and the status data in said first memory means whereby the previous status data stored in said first memory means is replaced by the next status data so that said one operated input key performs different functions when actuated more than once in a sequence of actuations.

4,523,299

MESSAGE TRANSMITTING SYSTEM FOR REPRODUCTION MACHINES AND COPIERS

James M. Donohue, Los Alamitos; Robert E. Markle, Rancho Palos Verdes, and George E. Mager, Hermosa Beach, all of Calif.; Stephen P. Wilczek, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 421,019
Int. Cl.³ G06F *9/00;* **G03G** *15/00*
U.S. Cl. 364—900 **4 Claims**



1. In a copy reproducing machine for making copies of

document originals having a master control module and remote operating modules cooperable with one another to form said copy reproducing machine, the combination of:

(a) a shared communication line linking said modules together, said shared communication line serving as the sole vehicle for communicating control instructions between said modules for making said copies;

(b) a shared line transmitter for each of said modules including

(1) means for addressing control instructions from the module to at least one other of said modules, and

(2) means for placing said control instructions following said addressing onto said shared communication line for transmission over said shared communication line to said modules; and

(c) a shared line receiver for each of said modules including

(1) means for detecting control instructions addressed to said module from control instructions addressed to other modules being transmitted on said shared communication line, and

(2) means for receiving said control instructions addressed to said module from said shared communication line to said module.

4,523,300

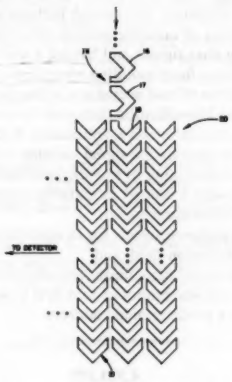
CHEVRON DETECTOR EXPANDER FOR MAGNETIC BUBBLE DOMAIN SYSTEM

Leonard R. Tocci, Mission Viejo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 278,501, filed as PCT US 80/00489, Apr. 28, 1980, published as WO 81/03237, Nov. 12, 1981, § 102(e), dated Apr. 28, 1980, abandonded. This application Apr. 28, 1980, Ser. No. 546,068

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—43 **24 Claims**



20. The combination comprising:

at least two expander bubble propagation elements arranged in a first row of an expander and having their surfaces uniformly spaced in juxtaposition including a first element at one end of said row and a second element at the other end of said row, said first expander element having a first side with a middle portion and first and second end portions, said second expander element having a first side with a middle portion and first and second end portions,

an input bubble propagation element associated with one of said first sides in said first row,

a second row of bubble propagation elements positioned in said expander on a first side of said first row, and

a third row of bubble propagation elements positioned in said expander on the second side of said first row whereby a bubble propagating from said input element to one of said expander elements first sides will expand to form a stripe in said expander.

4,523,301

ASSOCIATIVE MEMORY

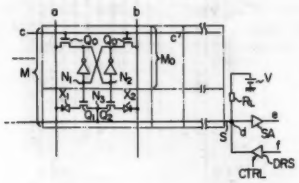
Hiroshi Kadota, Toyonaka, and Eisuke Ichinohe, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 1, 1983, Ser. No. 499,912

Claims priority, application Japan, Jun. 4, 1982, 57-96405

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—49 **5 Claims**



1. An associative memory comprising memory cells arrayed in columns and rows and each including a bistable circuit having two nodal points having complementary potentials and a pair of first switching elements controlling electrical connections between the nodal points and a pair of bit lines respectively, each of said bit line pairs being disposed for each column of said memory cells, a word line disposed for each row of said memory cells for controlling on-off of said first switching elements depending on its potential, a first series connection of a first rectifying element and a second switching element connected between a sense line and one of said bit lines in each of said memory cells, a second series connection of a second rectifying element and a third switching element connected between said sense line and the other of said bit lines in each of said memory cells, the control terminals of said second and third switching elements being connected to said complementary nodal points respectively in said bistable circuit in each of said memory cells, a sensing amplifier connected to each of said sense lines for sensing the potential thereof, a potential setting circuit connected to each of said sense lines for setting the potential thereof, and a load element connected at one of its terminals to each of said sense lines and at the other terminal to a power source.

4,523,302

CORE MEMORY WITH RETURN DRIVE SCHEME

Thomas J. Gilligan, Rolling Hills Estates, Calif., assignor to Ampex Corporation, Redwood City, Calif.

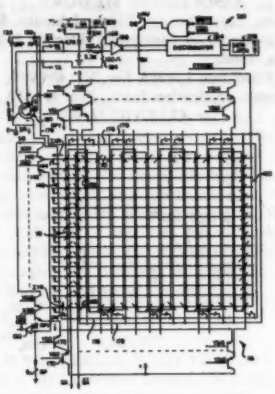
Filed Jul. 16, 1981, Ser. No. 283,973

Int. Cl.³ G11C *7/02, 11/061*

U.S. Cl. 365—195 **9 Claims**

2. A core memory drive system comprising a plurality of X conductors and a plurality of Y conductors inductively coupling an array of magnetic memory cores to provide coincident current selection of a selected core therein, the X conductors each having a drive end and an opposite common end coupled to a common end of each of the other X conductors, the Y conductors each having a drive end and an opposite common end coupled to a common end of each of the other Y conductors, an X drive circuit connected to generate a partial select X drive current in a selected one of the X conductors, the X drive circuit providing an oppositely directed return path for a proportionate share of the X drive current between the drive end of each unselected X drive conductor and a first bus; a Y drive circuit connected to generate a partial select Y drive current in a selected one of the Y conductors, the Y drive

circuit providing an oppositely directed return path for a proportionate share of the Y drive current between the drive end of each unselected Y drive conductor and a second bus; and a conductor interconnecting the first and second buses with the



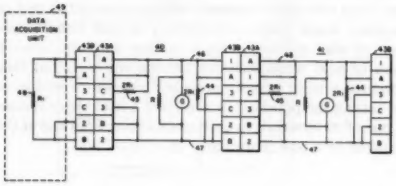
X and Y drive circuits being coupled such that one sources a drive end of a selected conductor while the other sinks a drive end of a selected conductor to provide a single current passing through both a selected X conductor and a selected Y conductor.

4,523,303

SEISMIC DATA GATHERING CABLE

Wilfried K. Lenhardt, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 7, 1982, Ser. No. 395,897
Int. Cl.³ G01V *1/16*
U.S. Cl. 367—20 **2 Claims**



1. A seismic data gathering cable, comprising:

(a) a plurality of cable sections each having a seismic detector and a pair of signal lines for carrying the seismic energy signals produced by said detector in response to the detection of seismic energy waves,

(b) a plurality of mating connectors between adjoining cable sections having at least four electrical terminals, first and second of said terminals connecting said pair of signal lines between said adjoining cable sections,

(c) a first shunting resistance located in each cable section and connected between said pair of signal lines,

(d) a second shunting resistance located in each cable section having one end connected to a first of said pair of signal lines within said cable section and the other end connected through a third of the terminals of said mating connectors to the second of said pair of second lines in the next succeeding cable section, and

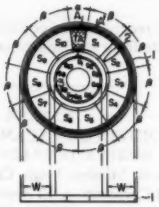
(e) a third shunting resistance located in each cable section having one end connected to a first of said pair of signal lines within said cable section and the other end connected through a fourth of the terminals of said mating connector to the second of said pair of signal lines in the immediately preceding cable section, whereby any of said cable sections may be reversed without affecting the electrical characteristics of said seismic cable.

4,523,304

OPTICAL DATA RECORDING AND REPRODUCING APPARATUS

Isao Satoh, Neyagawa; Tomio Yoshida, Katano; Shunji Harigae, Neyagawa, and Kenji Koishi, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 14, 1982, Ser. No. 368,361
Claims priority, application Japan, Apr. 17, 1981, 56-58927; Oct. 2, 1981, 56-157841
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—32 **13 Claims**



1. An optical data recording and reproducing apparatus comprising:

an optical disc including grooved guide tracks having a recording material formed thereon traceable by a laser light beam, each said guide track being divided into a plurality of sectors, each sector including an identification field formed of concave-convex pits and a data field for recording data signals and having a uniform groove, said identification field including identification data indicative of an address of said sector and a flag indicative of initiation of the identification data and formed in front of the identification data, said identification field being recorded with a first modulation signal variable in dependence on a signal corresponding to a clock pulse, said data field being recorded with a second modulation signal different from the first modulation signal;

a first demodulation means for demodulating the signals of said identification field; and

a second demodulation means for demodulating said data signals when the output of said first demodulation means produces a predetermined address.

4,523,305

MAGNETICALLY RECORDABLE LABEL FOR MECHANICALLY-DEFINED INFORMATION-BEARING DISCS

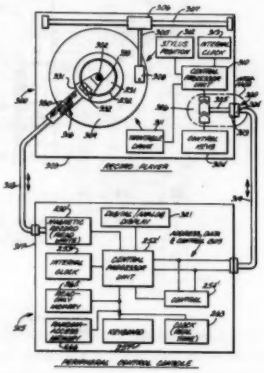
Robert G. Cheeseboro, 3525 S. Bronson Ave., Los Angeles, Calif. 90018

Continuation-in-part of Ser. No. 322,948, Nov. 19, 1981, Pat. No. 4,423,503, which is a continuation-in-part of Ser. No. 164,922, Jul. 1, 1980, Pat. No. 4,302,832, which is a division of Ser. No. 951,563, Oct. 16, 1978, Pat. No. 4,222,574, which is a division of Ser. No. 778,027, Mar. 16, 1977, Pat. No. 4,121,836.
This application Dec. 19, 1983, Ser. No. 562,853
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.³ G11B *3/68*
U.S. Cl. 369—33 **4 Claims**

1. The combination of a programmable record and a cooperatively arranged record player in which the record, when programmed, provides instructions to the record player for

commanding the record player to play back the record in a programmed sequence,

the record player comprising a read/write head for creating programming instructions on the record and for receiving the programming instructions from the record, a transducing means cooperable with the record for playback of primary information contained by the record apart from the programming instructions, and a logic/memory means for receiving the programming instructions from the read/write head and for directing the operation of the transducing means,



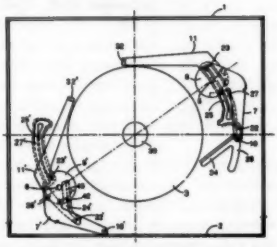
the record also comprising an outer annular region and a central annular region, the outer region containing primary information that is transducible by the transducing means on the record player, the central region comprising machine readable means cooperable with the read/write head for receiving and storing the programming instructions, such instructions being descriptive of the location on the outer annular region of a least one discrete portion of the primary information.

4,523,306

RECORD LOADING APPARATUS FOR A SLOT TYPE RECORD PLAYER

Marcel J. H. Staar, Brussels, Belgium, assignor to Staar S. A., Belgium

Filed Jan. 4, 1984, Ser. No. 568,140
Claims priority, application Belgium, Jan. 28, 1983, 0/209993
Int. Cl.³ G11B *17/04, 25/04*
U.S. Cl. 369—77.1 **9 Claims**



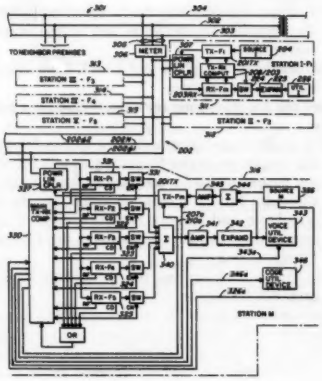
1. In a record player apparatus for automatically guiding and centering records of different sizes on a driving spindle, the combination comprising, a base, a record support helically rotatable on the base between a raised load position for receiving a record and a lowered play position for positioning a record on the driving spindle, two pairs of levers mounted for pivotable movement on the support at diametrically opposed pivot points, means on the levers for engaging a record in the load position, guide means for the levers for guiding the record to a centered position as the record is inserted into the player, and trigger means responsive to the degree of deflection of the lever pairs for initiating the helical rotation of the record support from the load to the play position.

4,523,307

POWER LINE CARRIER MULTI TELEPHONE EXTENSION SYSTEM FOR FULL DUPLEX CONFERENCING AND INTERCOM BETWEEN TELEPHONES

William M. Brown, Acton, and James R. Lindquist, Rowley, both of Mass., assignors to Astech, Inc., Bedford, Mass.

Filed Nov. 30, 1982, Ser. No. 445,499
Int. Cl.³ H04M *11/00*
U.S. Cl. 370—30 **27 Claims**



19. A telephone extension system for signalling between a telephone subscriber's telephone line of a conventional telephone communication system wherein a separate telephone line is provided from a central switching system at one location to each subscriber at the subscriber's premises and two or more of the subscriber's extension telephones over a two element transmission line at the subscriber's premises, referred to herein as the premises transmission line, including at the premises: a main station (M) near the telephone line and having access to the two element transmission line and two or more extension stations (E_1, E_2--En--EN), each having access to the two element transmission line, comprising,

(a) at the M station:

(a1) detector means connected to the telephone line for detecting audio frequency signals on the telephone line, said detected signals referred to herein as TL signals,

(a2) a transmitter for producing a main carrier frequency signal, Fm, and including modulating means in said transmitter for modulating said Fm signal,

(a3) N receivers, one for each of the En stations, each receiver for receiving a different one of the En stations transmitted RF carrier frequency signals, F_1, F_2--Fn---FN, and said receiver including an F_n demodulator, for re-producing modulations of Fn at the output of the receivers,

(a4) first combining means for combining the outputs of said N receivers to produce a combined receiver output signal referred to herein as MRXN,

(a5) second combining means comprising a mulitport hybrid network for combining the TL signals and MRXN signals and coupling the combined signals to

the input of said transmitter, said transmitter input being referred to herein as MTX, and

(a6) coupling means for coupling the transmitter output to the transmission line, and

(a7) mode command means for producing an intercom mode command signal, herein referred to as the I signal to control the operation of the hybrid network such that the MRXN and TL signals are or are not combined and MRXN is or is not coupled to the telephone line, depending upon the occurrence of said I signal;

whereby the premises transmission line carries the modulated Fm to the N E stations; and

(b) at each E section, denoted generally as En:

(b1) an En telephone,

(b2) a source of power for the En telephone,

(b3) said En telephone including means for producing audio and dial signals when it is used by the subscriber,

(b4) an En receiver for receiving the modulated Fm from the power line, said En receiver including an Fm demodulator for re-producing the modulations of Fm in the output thereof, said output referred to herein as EnRX

(b5) means for coupling the received modulated Fm from the premises transmission line to the input of the receiver, and

(b6) means for coupling said EnRX from said En receiver to the En telephone,

whereby the En telephone receives the audio signals, TL and MRXN,

(b7) an En transmitter including means for producing an En telephone carrier frequency signal, Fn, and modulating means in said En transmitter for modulating said Fn signal by the En telephone audio signals from the En telephone and signals representative of the En dial signals from the En telephone to produce a modulated Fn signal and

(b8) means for coupling the modulated Fn signal to the premises transmission line,

whereby said line carries the modulated Fn to the main station and telephone calls from the telephone line can be answered by any of the E_1, E_2--En--EN telephones and any or all of the E_1, E_2--En--EN telephones can conference on a telephone line call.

4,523,308

TELEPHONE CONCENTRATOR SWITCH ARRANGEMENT

John Bull, Lithia; Leon Croft; David B. DeVaney, both of Longwood; Russell R. Davis, Geneva; David L. Hinshaw; Haresh C. Jotwani, both of Longwood; Ronald J. Kandell, Winter Springs; Richard F. Kurtz, Longwood; Ernest O. Lee, Jr., Longwood; Gunter F. Neumeier, Longwood; Glenn L. Richards, Longwood, and Richard Scott, Longwood, all of Fla., assignors to Stromberg-Carlson Corporation, Lake Mary, Fla.

Filed Sep. 29, 1982, Ser. No. 427,513

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—56 **24 Claims**

1. A telephony network comprising a plurality of subscriber lines, each subscriber line being connected to one of a plurality of line switch means, with each line switch means being connected to a central office over a plurality of port group highways,

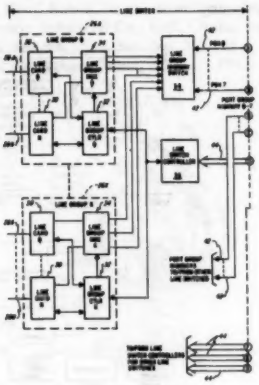
a. each line switch means including:

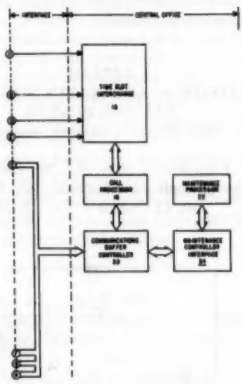
(i) line group means connected to a plurality of subscriber lines for converting the voice signals between analog and digital form;

(ii) a plurality of line group highway means connected to said line group means for transferring the digital voice signals from and to the line group means in a plurality of time slot channels;

(iii) line group highway switch means for selectively coupling the digital voice signals between all of the plurality of line group highway means and the port group highways during the time slot channels thereby to permit voice signals to be coupled between any subscriber line and any port group highway during each time slot channel; and

(iv) control means for selectively determining for said line group highway switch means a line group highway means, the port group highways and the time slot channels to effect the transfer of the voice signals between





said line group highways and said port group highways for each call; and

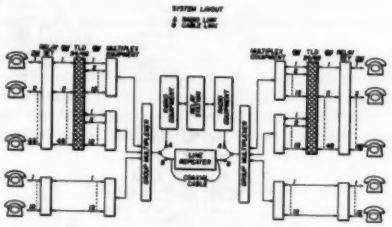
b. the central office means including (i) receiving means connected to the port group highways from all of said line switch means for receiving digital voice signals from and transmitting digital voice signals over said port group highways; and (ii) switch means for switching digital voice signals among said receiving means.

4,523,309

TIME ASSIGNMENT SPEECH INTERPOLATION APPARATUS

Joshua Piasecki, Ramat-Gan; Reuven Zelinkovsky, Moshav Beit Yehoshua; Aharon Segev, Kiryat Ono, and Teodor Henquin, Tel-Aviv, all of Israel, assignors to Electronics Corporation of Israel, Ltd., Tel-Aviv, Israel

Filed Dec. 4, 1979, Ser. No. 100,270
Int. Cl.[3] H04J 6/02
U.S. Cl. 370—81 31 Claims



1. A time assignment speech interpolation communication system for interconnecting a transmission trunk link having a plurality of communication channels to a second plurality of telephone communication lines, the second plurality exceeding the first plurality, and comprising:

transmission apparatus at a first end of the transmission trunk link including first input/out means comprising A-D conversion means operative to translate signals received along at least one of said second plurality of communications lines into digital form, digital means for detecting signals on said second plurality of telephone communication lines, and means for assigning each telephone communication line on which signals are present to an available one of the first plurality of communication channels, and second input/output means comprising D-A conversion means operative to translate said signals in digital form for transmission along at least one of said first plurality of communication channels into analog form;

receiving apparatus at a second end of the transmission link including third input/output means comprising A-D conversion means operative to translate signals received along at least one of said first plurality of communication channels into digital form, means for assigning each of the first plurality of communication channels carrying signals to a corresponding one of said second plurality of communication lines in accordance with assignment information received from said transmission apparatus, and fourth input/output means comprising D-A conversion means operative to translate signals in digital form into analog form for transmission along at least one of said second plurality of communication lines,

at least one of said first, second, third and fourth input/output means including direct digital input/output means operative to permit direct digital communication with at least one of said first plurality of communication channels and said second plurality of communication lines;

apparatus for communicating messages including assignment information between said transmission apparatus and said receiving apparatus;

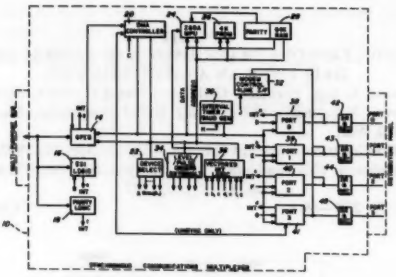
said transmission apparatus, receiving apparatus and message communicating apparatus being operative for selectable analog and digital speech signal transmissions along said transmission trunk link.

4,523,310

SYNCHRONOUS COMMUNICATIONS MULTIPLEXER

William H. Brown, Coral Springs; James A. Starkweather, Fort Lauderdale, and Hugh M. Humphreys, Coral Springs, all of Fla., assignors to Gould Computer Systems Inc., Fort Lauderdale, Fla.

Filed Jan. 28, 1983, Ser. No. 462,056
Int. Cl.[3] H04J 3/02
U.S. Cl. 370—112 7 Claims



1. A synchronous communications multiplexer adopted to couple a synchronous communications line to a host computer via multi-purpose bus and an input output processor, said host computer generating a plurality of microcode instruction sets, each microcode instruction set corresponding to a different communications protocol and mode of data transfer over said communications line, said host computer generating control commands relating to the data transfer across said communications line including a load control command and a write command in one instance for sending one data block outbound across said communications line in accordance with one mode of data transfer and a read command in another instance for receiving another data block inbound across said communications line; the synchronous communications multiplexer comprising:

a microprocessor means coupled to an internal bus;

an I/O interface means for interfacing said microprocessor means to said multi-purpose bus via said internal bus;

memory means for storing the outbound data block and the corresponding microcode instruction set, and said memory means being coupled to said internal bus;

direct memory access controller means for transferring said outbound data block between said multi-purpose bus and said memory means via said internal bus and said interface means upon receipt of a first transfer command;

a port being coupled to said communications line;

a port interface means for transferring data to and receiving data from said port, said port interface means including a programmable modem control and line interface circuit means for generating and detecting various line communication control signals which control the outbound and inbound transfer of data blocks across said port and said communications line, and said port interface means being coupled to said internal bus;

said microprocessor means including:

means for obtaining the corresponding microcode instruction set related to said one mode of data transfer and storing the same in said memory means upon receipt of said load control command;

means for executing said corresponding microcode instruction set upon storage thereof in said memory means and programming said programmable modem control and line interface circuit means in accordance therewith;

means for generating said first transfer command upon receipt of said write command in said one instance and applying said first transfer command to said direct memory access controller means;

means for controlling said port interface means to direct said outbound data block over said communications line from said memory means; and

means for coordinating the inbound transfer of said another data block received at said port to said multi-purpose bus upon receipt of said read command.

4,523,311

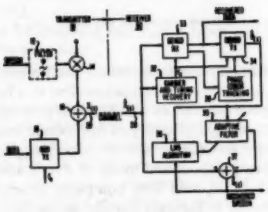
SIMULTANEOUS TRANSMISSION OF SPEECH AND DATA OVER AN ANALOG CHANNEL

Edward A. Lee, Berkeley, Calif., and David G. Shaw, Middletown, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 483,923, Apr. 11, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 672,155

Int. Cl.³ H04J *1/02*

U.S. Cl. 370—69.1 **7 Claims**



1. A receiver comprising:

an input terminal capable of simultaneously receiving an analog speech signal which includes a predetermined power density characteristic over a predetermined bandwidth, and a modulated data signal which is received in a portion of the received analog speech signal bandwidth where the analog speech signal is present and the power density characteristic of the analog speech signal is at a low value;

a first and a second output terminal

means capable of demodulating the data signal from a received composite analog speech and modulated data signal for transmission to the first output terminal and for generating phase error signals detected in the received data signal;

means capable of remodulating the recovered data signal at the output of the demodulating and recovering means while introducing said phase jitter and frequency offset information signals for generating an output signal corresponding substantially to the data signal received at the input terminal of the receiver including said phase error signal;

adaptive filtering means capable of generating a first signal representative of an estimate of an impulse response of a channel connected to the input terminal of the receiver, and convolving said first signal with the remodulated data output signal from the remodulating means to generate a resultant output signal; and

means capable of subtracting the resultant output signal generated by the adaptive filtering means from the composite analog speech and modulated data signal received at the input terminal of the receiver for substantially cancelling the data signal forming part of the composite received signal and generating a resultant output signal at the second output terminal of the receiver which comprises the recovered analog speech signal.

4,523,312

IC TESTER

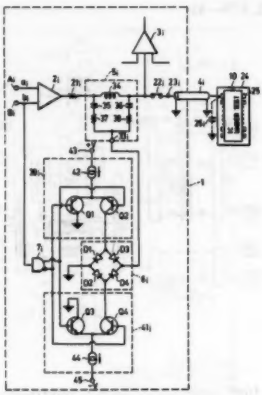
Kunio Takeuchi, Gyoda, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,742

Claims priority, application Japan, Oct. 29, 1981, 56-173428

Int. Cl.³ G01R *31/28;* **G06F** *11/00*

U.S. Cl. 371—1 **18 Claims**



1. An IC tester for testing an IC having a plurality of terminal pins by supplying a plurality of test pattern signals to the terminal pins and by receiving outputs from the IC in response to the test pattern signals, comprising:

a plurality of drivers with output terminals for supplying the test pattern signals to respective ones of the terminal pins of the IC being tested;

a plurality of connector lines for being respectively connected between said output terminals of said drivers and the respective the terminal pins of the IC being tested for passing therethrough the test pattern signals from said drivers, said connector lines having characteristic impedances equal to the output impedances of said drivers; and

a plurality of low-pass filters respectively connected between said output terminals of said drivers and said connector lines, said low-pass filters having nominal impedances equal to said output impedances of said drivers and cutoff frequencies selected so that differences between propagation times required for the test pattern signals to reach the terminal pins of the IC being tested are smaller than a predetermined value.

4,523,313

PARTIAL DEFECTIVE CHIP MEMORY SUPPORT SYSTEM

Chester M. Nibby, Jr., Peabody; Reeni Goldin, Somerville, and Timothy A. Andrews, Arlington, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1982, Ser. No. 450,846

Int. Cl.³ G06F *11/20;* **G11C** *13/00*

U.S. Cl. 371—10 **30 Claims**

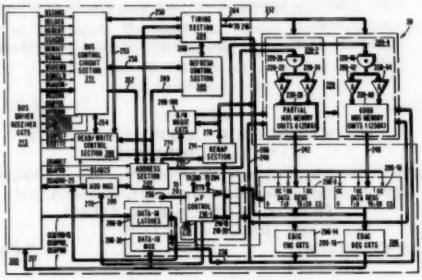
1. An addressable semiconductor memory system for providing a number of word locations for storing information words having a number of bits, said system comprising:

an addressable partially good memory including a plurality of partially good RAM chips, each chip having a number of internal rows and columns of bit locations containing a predefined small number of faults distributed randomly, said chips being organized into a number of system rows and columns, said number of system columns being organized into a number of groups, each group providing a different portion of said number of word locations;

an addressable good memory including a plurality of defect-free RAM chips, each chip being organized into said number of internal rows and columns of bit locations, said chips being organized into at least one system row and said number of system columns, said number of system columns being organized into said number of groups, each group providing an assigned portion of said number of word locations;

an addressable RAM static memory having a plurality of locations much less in number than said partially good memory, each location for storing a column address specifying one of said number of internal column locations in said good memory and a number of slice bit signals coded to specify the operating status of each of said number of groups of a corresponding word location in said partially good memory;

addressing means coupled to receive row and column address portions of a memory command, said address means being coupled to said partially good memory for applying said row and column address portions to said partially good memory, said addressing means including means



coupled to said good and static memories, said means for selectively applying one of said memory command row and column address portions to said static memory for read out of said column address and said slice bit signals of one of said locations and the other one of said row and column address portions to said good memory and said good memory being coupled to receive said column address from said static memory; and,

control means coupled to each of said memories, said control means being operative in response to said memory command specifying a memory write operation and said slice bit signals read out from said one location of said static memory to generate selectively control signals for simultaneously conditioning for writing, only those groups of chips in the system rows of said partially good and good memories specified by said coding of said slice bit signals, said specified groups of chips providing a defect-free word location composed of portions of said addressed good memory location and portions of said addressed partial memory location as specified by said coding of said slice bit signals.

4,523,314

READ ERROR OCCURRENCE DETECTOR FOR ERROR CHECKING AND CORRECTING SYSTEM

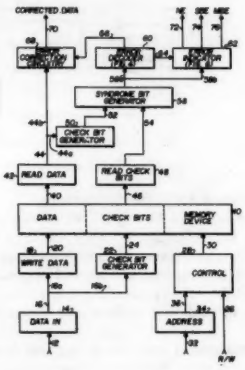
Gary D. Burns, Cottage Grove, and Scott D. Schaber, St. Paul, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,184
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—38 **13 Claims**

1. An improved error occurrence detector for use with an error correction code system that has check bits associated with data words and includes circuitry for providing reconstituted check bits for the data words and syndrome bit generating circuitry responsive to the check bits and the reconstituted check bits for providing syndrome bits, said error occurrence detector comprising:

first circuit means responsive to selected ones of the syndrome bits for providing first signals indicative of multiple bit errors and check bit single bit errors;

adder means responsive to predetermined combinations of syndrome bits for providing second signals indicative that more than one syndrome bit is present, said adder means including a plurality of full adder circuit means each responsive at least in part to different ones of the syndrome bits, and each capable of providing sum and carry output signals;



gate circuit means responsively coupled to said adder means for providing third signals in response to said second signals indicative that single bit or multiple bit errors have occurred, and for providing fourth signals in the absence of said second signals indicative that a check bit single bit error or no error has occurred; and

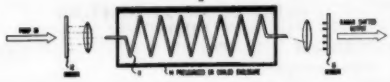
selector means responsively coupled to said first circuit means and said gate circuit means for providing first indicating signals indicative of a first type of detected error and for providing second indicating signals indicative of a second type of detected error in response to said first, third and fourth signals.

4,523,315

RAMAN GAIN MEDIUM

Julian Stone, Rumson, N.J., assignor to AT&T Bell Laboratories, N.J.

Filed Apr. 9, 1982, Ser. No. 367,093
Int. Cl.³ H01S *3/30*
U.S. Cl. 372—3 **10 Claims**



1. A Raman laser comprising

a gain medium comprising a length of filamentary waveguide comprising multiatomic Raman-active molecules contained interstitially in at least some of the waveguide material, the laser further comprising

means for coupling pump radiation into the waveguide,

means for resonating within the waveguide Raman radiation emitted by the molecules

and

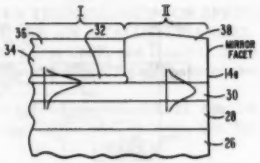
means for coupling at least a part of the Raman radiation out of the waveguide.

4,523,316

SEMICONDUCTOR LASER WITH NON-ABSORBING MIRROR FACET

Dan Botez, Mount Holly, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1982, Ser. No. 437,838
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **9 Claims**



1. A semiconductor laser comprising:

a body of material having a pair of opposed mirror facets which are reflective of light, at least one of which is partially transmissive of light, said body including:

a substrate having first and second opposed surfaces with a pair of substantially parallel channels with a mesa therebetween, in said first surface and extending between said facets;

a first confinement layer overlying said first surface and the surfaces of said channels and said mesa;

a guide layer overlying said first confinement layer and tapering in thickness in the lateral direction;

an active layer overlying a portion of the guide layer and extending towards but not contacting at least one of said facets, thereby forming a first region in the body where said active layer overlies the guide layer and a second region where said active layer does not overlie said guide layer;

a second confinement layer overlying said active layer in said first region;

a confinement region overlying said guide layer in said second region; and

first and second electrical contacts overlying said second confinement layer and said second surface respectively;

wherein the lateral tapers of the guide layer in the first and second regions are different; and

wherein said active layer has a larger refractive index than said guide layer, said first and second confinement layers and said confinement region.

4,523,317

SEMICONDUCTOR LASER WITH REDUCED ABSORPTION AT A MIRROR FACET

Dan Botez, Mount Holly, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1982, Ser. No. 437,839
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **8 Claims**

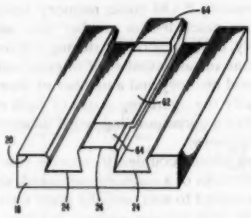
1. A laser comprising:

a body of semiconductor material having a pair of opposed mirror facets which are reflective of light, at least one of which is partially transmissive of light, said body including:

a substrate having first and second opposed major surfaces and having a pair of channels, with a mesa therebetween, in said first major surface and extending between said facets;

a first confinement layer overlying said first major surface and the surface of said channels and said mesa;

an active region, comprising a guide layer and an adjacent active layer, overlying said first confinement layer, said active layer extending to said facets and having a thinner portion thereof at at least one of said mirror facets which has a non-zero thickness over said mesa which is less than the thickness of a thicker portion of said active layer over the remainder of said mesa;



a second confinement layer overlying said active region;

a first electrical contact overlying said second confinement layer; and

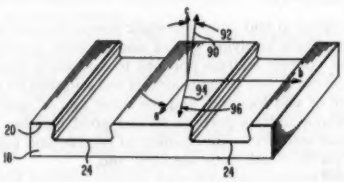
a second electrical contact overlying said second major surface.

4,523,318

SEMICONDUCTOR LASER HAVING HIGH MANUFACTURING YIELD

John C. Connolly, Cranbury, and Dan Botez, Mount Holly, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1982, Ser. No. 437,840
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—48 **7 Claims**



1. In a laser comprising a body of semiconductor material, said body including a substrate having a pair of channels in a first major surface thereof with a mesa therebetween, a first confinement layer overlying the first major surface, the mesa and partially filling the channels; a light propagation region, comprising an active layer, overlying the first confinement layer; and a second confinement layer overlying the light propagation region:

the improvement which comprises the first major surface of the substrate being misoriented from a member of the {100} family of crystallographic planes by a tilt angle between about 0.2° and 1.5° with a misorientation angle of between about 5° and 45°.

4,523,319

LASER TAPE SYSTEMS

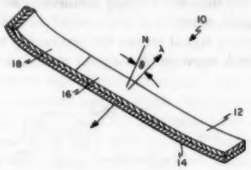
Dale R. Pfost, Los Altos, Calif., assignor to Brown University, Providence, R.I.

Filed May 10, 1983, Ser. No. 493,149
Int. Cl.³ H01S *3/06*
U.S. Cl. 372—54 **20 Claims**

1. A laser tape system for use in a resonant cavity of a laser having a source of excitation energy, the tape system comprising:

A. a flexible tape carrying at least one lasing dye and located within the resonant cavity;

B. a drive means for moving the tape such that the excitation



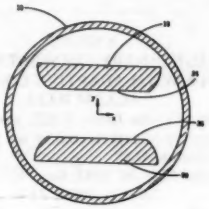
energy can be focused on different portions of the tape within the cavity and

an energy extraction means for extracting the energy from the resonant cavity.

4,523,320
UNIFORM-FIELD ELECTRODE

Eddy A. Stappaerts, Rancho Palos Verdes, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 14, 1983, Ser. No. 457,985
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—87 **2 Claims**



1. Apparatus for producing a uniform electric field, the apparatus being defined relative to a 3-dimensional Cartesian coordinate system having X, Y and Z principal axes, comprising:

two elongated electrodes disposed on opposite sides of the X-Z plane; and

means for applying a voltage between the two electrodes;

each electrode having a surface facing the other electrode which is symmetrical about the Y-Z plane, which has its longitudinal dimension parallel to the Z-axis, and which has a transverse cross-section whose contour satisfies the following equation:

$$dy/dx = -E_x/E_y$$

wherein E_x and E_y are the following fuctions of x and y:

$$\begin{aligned} E_x/E_o = {} & (a^2 - b^2 - ax + by)/[(x-a)^2 + (y-b)^2] \\ & - (a^2 - b^2 - ax - by)/[(x-a)^2 + (y+b)^2] \\ & - (a^2 - b^2 + ax + by)/[(x+a)^2 + (y-b)^2] \\ & + (a^2 - b^2 + ax - by)/[(x+a)^2 + (y+b)^2] \\ E_y/E_o = {} & (2ab - ay - bx)/[(x-a)^2 + (y-b)^2] \\ & + (2ab + ay - bx)/[(x-a)^2 + (y+b)^2] \\ & + (2ab - ay + bx)/[(x+a)^2 + (y-b)^2] \\ & + (2ab + ay + bx)/[(x+a)^2 + (y+b)^2] \end{aligned}$$

and wherein E_o is a scale factor having any desired value either greater than or less than zero and a and b are parameters whose values are uniquely determined as follows by a parameter p having a value greater than 0.18 and less than or equal to one:

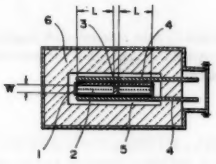
$$a^2 = (2\sqrt{p} - 1 + p)/(4p)$$

$$b^2 = (2\sqrt{p} + 1 - p)/(4p).$$

4,523,321
VERTICAL CARBONIZING FURNACE FOR USE IN THE PRODUCTION OF CARBON FIBERS

Yukihiro Murakami, Ehime; Shigeomi Murakami, Otsu, and Katsunosuke Maeda, Nishinomiya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,526
Claims priority, application Japan, May 26, 1982, 57-88119
Int. Cl.³ F27B *9/04*
U.S. Cl. 373—110 **15 Claims**



1. A vertical carbonizing furnace comprising:

a conduit through which a plurality of precursors pass, said conduit being disposed vertically;

a plurality of heaters vertically disposed at the outside of said conduit;

an inert gas introduction inlet provided in the lower portion of said conduit and an exhaust gas discharge pipe provided at the upper portion of said conduit;

a water seal sealing the lower end of said conduit by virtue of having the lower end of said conduit immersed in water;

a gas withdrawal outlet provided between said water seal and said inlet gas introduction inlet; and

a gas feeding duct for reuse through which said gas withdrawal outlet is in communication with the upper portion of said conduit.

4,523,322
INTERFACE DEVICE FOR MODEMS

Jean-Claude Abbiate, La Gaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,565
Claims priority, application 12291981, Dec. 29, 1981, 81430044.8
Int. Cl.³ H04L *7/02*
U.S. Cl. 375—36 **5 Claims**

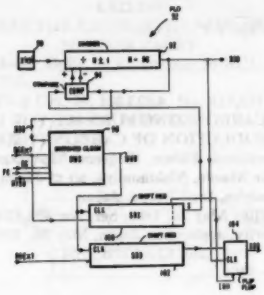
1. An interface device for synchronizing together an internally clocked modem and at least one data terminal equipment (DTE) each of said DTE being provided with a clock circuit for generating an external clock signal RC Ext, said interface inciuding:

a phase locked oscillator (PLO) provided with a control input and generating a recovered clock signal (XCO) to be used for adjusting said modem clock;

a switched clock generating circuit connected to said PLO and provided with one of said RC Ext signals for deriving a switched clock signal representative of the phase delay between said recovered clock signal and said one RC Ext signal;

a first shift register provided with said one RC Ext signal and controlled by said switched clock signal for providing a shifted reference signal, said reference signal being applied to said PLO control input;

a second shift register connected to said at least one DTE for receiving data therefrom, and controlled by said switched clock signal for shifting said data; and



a gate connected to said second shift register and controlled by said recovered clock signal for providing in phase data to said modem.

4,523,323

DIGITAL SIGNAL COMMUNICATION SYSTEM FOR MULTI-LEVEL MODULATION INCLUDING UNIQUE ENCODER AND DECODER

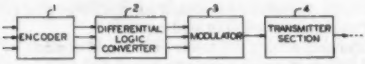
Masahiro Nakajima, and Hiromi Hashimoto, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1983, Ser. No. 465,789

Claims priority, application Japan, Feb. 15, 1982, 57-23399

Int. Cl.³ G06F *11/12*

U.S. Cl. 375—37 **9 Claims**



1. A digital signal communication system comprising transmitter means having first means for differentially converting first digital signals of n trains (n is an integer of 3 or larger) into second digital signals of n trains comprising a plurality of words, second means responsive to said second digital signals for providing a modulated signal with $2^n(=N)$ modulation levels, third means for transmitting said modulated signal, receiver means having fourth means for receiving said modulated signal, fifth means for demodulating the output from said fourth means to provide third digital signals of n trains corresponding to said second digital signals, and sixth means for differentially converting said third digital signals of n trains to provide fourth digital signals of n trains corresponding to said first digital signals, the second and third means being characterized in that the Hamming distance between two words of said second and third digital signals corresponding to two adjacent modulation levels is either 1 or 2 and each of the Hamming distance of 1 and of 2 is equal to N/2.

4,523,324

DIRECT MODULATION FM DATA RECEIVER

Christopher B. Marshall, Horley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1982, Ser. No. 435,426

Claims priority, application Netherlands, Oct. 26, 1981, 8132181

Int. Cl.³ H03D *3/13*

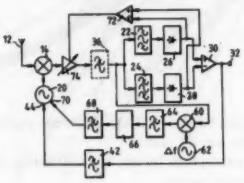
U.S. Cl. 375—91 **3 Claims**

1. A direct modulation FM data receiver, comprising:

an input signal receiving element for receiving a directly-modulated FM input signal having a channel frequency within a channel frequency range of $f_c \pm \Delta f$ wherein f_c is the frequency of a carrier signal and Δf is a frequency deviation from the carrier signal;

a signal mixer having a first input, a second input, and an output, the first input being connected to the input signal receiving element;

local oscillator signal means for producing and applying, to the second input of the signal mixer, a local oscillator



signal having a frequency within the channel frequency range of the FM input signal, but offset from the frequency of the carrier signal by an offset frequency amount δf, and

demodulating means, connected to the output of the signal mixer, for distinguishing between signalling tones $\Delta f + \delta f$ and $\Delta f - \delta f$ of an output signal of the signal mixer and deriving, from the signalling tones $\Delta f + \delta f$ and $\Delta f - \delta f$, an output data signal.

4,523,325

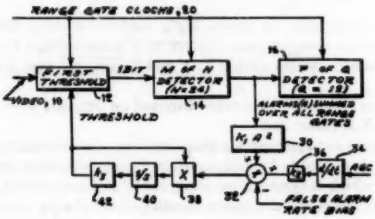
THREE-STAGE BINARY COINCIDENCE DETECTOR APPARATUS WITH ADAPTIVE CONSTANT FALSE ALARM RATE

Jimmie J. Justus, Yorba Linda, Calif., assignor to The Unites States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1982, Ser. No. 382,069

Int. Cl.³ H03K *13/00*

U.S. Cl. 377—44 **6 Claims**



1. A three-stage binary coincidence detector apparatus with an adaptive constant false alarm rate comprising in combination:

a threshold means for establishing a first threshold level, said threshold means receiving a video signal, said threshold means receiving a range gate clock signal, said threshold means sampling said video signal at said range gate clock signal rate, said threshold means providing a logical output for each range gated video level that exceeds said first threshold level,

a first counter for counting a first predetermined number of digital bits, said first counter receiving said logical output from said threshold means, said first counter means having a first predetermined binary length, said first counter recieving said range gate clock signal, said first counter providing a binary bit output every time said first predetermined number is exceeded,

a second counter for counting a first predetermined number

of binary bits, said second counter receiving said binary bit output from said first counter, said second counter having a second predetermined binary length, said second counter receiving said range gate clock signal, said second counter providing an alarm signal when said first predetermined number of binary bits is either equalled or exceeded, and,

a threshold feedback loop connected between said first and second counters to said threshold means, said threshold feedback loop receiving a false alarm rate bias signal and an AGC signal, said threshold feedback loop receiving said alarm signal from said first counter, said threshold feedback loop providing a threshold set signal to said threshold means.

4,523,326

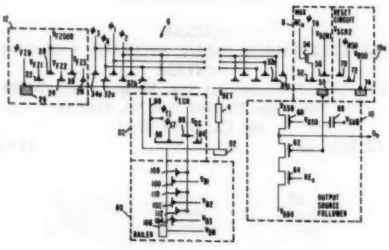
LOW NOISE CHARGE COUPLED IMAGER CIRCUIT

Mary J. Hewitt, Playa del Rey, and Arthur L. Morse, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 17, 1983, Ser. No. 458,607

Int. Cl.³ G11C *19/28;* **H01L** *29/78, 27/14, 31/00*

U.S. Cl. 377—58 **4 Claims**



1. A low noise charge transfer device imager formed on a semiconductive substrate, comprising:

a plurality of semiconductive photodetectors organized by columns;

a plurality of column charge transfer device registers disposed to receive charge from each corresponding column of photodetectors, said charge transfer device registers including pluralities of charge transfer device gates connected to receive clock signals;

means for integrating charge from each photodetector during an integration period and therefater injecting the integrated charge into an adjacent portion of the corresponding one of said column charge transfer device registers as a charge packet;

means for multiplexing the output signals from each of said charge transfer device registers;

a reference column charge transfer device register;

means for subtracting the output from each of said charge transfer device column registers from that of said reference column charge device registers;

means for periodically bailing a certain amount of charge from said integrating means by a selected number of times during said integration; and

a FAT zero charge injector including a FAT zero metering gate overlying said substrate at the input to each of said column charge transfer device registers including means for applying an electrical potential to said metering gate to form a surface potential well therebeneath in said substrate registered to said metering gate, the effective area of said metering gate being reduced to a small amount relative to the effective area of said charge transfer device gates.

4,523,327

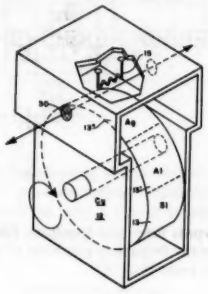
MULTI-COLOR X-RAY LINE SOURCE

Jay D. Eversole, Lancaster, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 5, 1983, Ser. No. 455,674

Int. Cl.³ H01J *35/04*

U.S. Cl. 378—124 **17 Claims**



1. A multi-target X-ray source comprising:

an envelope;

an anode rotatably supported within the envelope and having an annular target portion;

an electron emitting cathode supported within the envelope in spaced relationship with the target portion;

the target portion being comprised of a plurality of segments of different target materials of a substantially uniform thickness, with the target material of each segment being an integral unit having a smooth continuous surface;

wherein said envelope includes a window of beryllilum which is very thin and has a small aperature, the window being attached to a port in said envelope by a flexible bellows and mounted to permit manipulation of the aperature to adjust the take off angle of the X-ray beam which passes through the window.

4,523,328

FM-RECEIVER INCLUDING A FREQUENCY-LOCKED LOOP

Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,229

Claims priority, application Netherlands, Mar. 9, 1982, 8200959

Int. Cl.³ H04H *5/00*

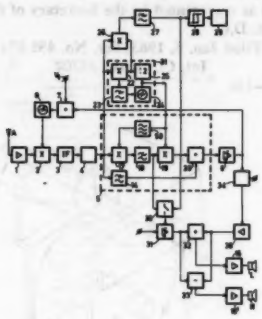
U.S. Cl. 381—3 **8 Claims**

1. An FM-receiver comprising a frequency lock loop including a voltage controlled oscillator, a mixer connected to receive an aerial input signal and said voltage controlled oscillator output signal, an IF filter connected to receive an IF signal from said mixer, an FM-detector connected to demodulate an IF signal from said IF filter, a loop filter connected to provide a control voltage from said FM-detector through a loop amplifier to said voltage controlled oscillator comprising:

a first lowpass filter for selecting an audio-frequency stereo sum signal from a stereophonic FM multiplex signal; and

a bandpass filter in parallel with the first lowpass filter for selecting a difference stereo signal amplitude modulated

on a suppressed stereo sub-carrier from a stereophonic FM-multiplex signal;

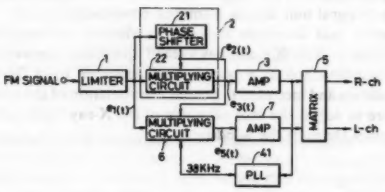


said first lowpass filter and bandpass filter having a phase shift within the frequency passband of the frequency lock loop of not more than 90°.

4,523,329
FM RECEIVER

Kohji Ishida; Tatsuo Numata, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,781
Claims priority, application Japan, Sep. 4, 1982, 57-154224
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—3 **8 Claims**



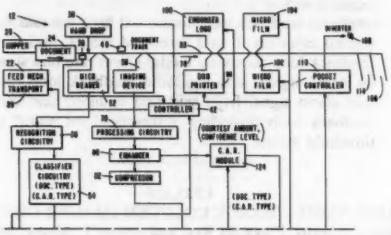
1. An FM receiver, comprising:
a phase shifter (21) for shifting the phase of an incoming FM signal by an amount corresponding to the frequency of said FM signal;
a first multiplier (22) for multiplying said incoming FM signal and the output of said phase shifter, thereby producing a main signal (L+R);
a generator of an FM subcarrier wave; and
a second multiplier (6), connected in parallel with said first multiplier, for multiplying said FM signal, the output of said phase shifter, and the output of said generator thereby producing a subsignal (L−R).

4,523,330
BANKING SYSTEM AND METHOD

John D. Cain, Kitchener, Canada, assignor to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Dec. 23, 1982, Ser. No. 452,563
Int. Cl.³ G06K *9/20*
U.S. Cl. 382—7 **10 Claims**

1. An apparatus for processing documents, comprising:
a unit for reading machine-readable data including courtesy amount location data and for generating image data from said documents as said documents are moved along a track in operative relationship with said unit;
said unit also including recognitin means receiving said image data and a portion of said machine-readable data including said courtesy amount location data to produce courtesy amount data along with confidence level data relative to said courtesy amount data for each said document; and

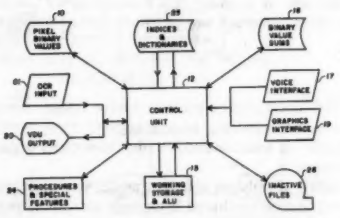


control means operatively coupled to said recognition means for storing said machine-readable data, image data, courtesy amount data, and confidence level data by an identification number which is assigned thereto by said control means for each corresponding said document.

4,523,331
AUTOMATED IMAGE INPUT, STORAGE AND OUTPUT SYSTEM

Satya P. Asija, 7 Woonsocket Ave., Shelton, Conn. 06484

Filed Sep. 27, 1982, Ser. No. 424,731
Int. Cl.³ G06K *9/00*
U.S. Cl. 382—18 **15 Claims**



1. An automated image input, recognition, storage output, generation and retrieval system comprising:
(a) an input device;
(b) an output device;
(c) a binary value sums storage unit;
(d) a procedures and special features (such as design parameters) storage unit;
(e) a working storage unit;
(f) an index storage unit;
(g) plurality of active and inactive files storage units;
(h) (miscellaneous) interface unit; and
(i) a control unit connected to said input device, said output device, said binary value sums storage unit, said procedures and special features or design parameters storage unit, said working storage unit, said plurality of active and inactive files storage units, said (miscellaneous) interface unit such that each unit of the system is capable of transferring information, images and data to and from any other unit of the system individually and collectively under command signals from the control unit via said interface unit in accordance with the procedures stored in said procedures (and special features) storage unit and wherein an image to be input is comprised of a plurality of pixels, each pixel being assigned a power of two that is unique with respect to all other pixels in the image and

wherein said binary value sums storage unit stores a binary sum that is the algebraic sum of each pixel of said image.

4,523,332

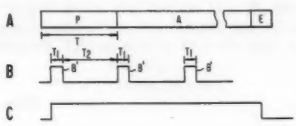
BATTERY SAVER CIRCUIT FOR USE WITH PAGING RECEIVER

Toshihiro Mori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 484,023
Claims priority, application Japan, Apr. 14, 1982, 57-62714
Int. Cl.³ H04B *1/16;* H04Q *9/14*
U.S. Cl. 455—343 **10 Claims**

1. A battery saver circuit for use with a pager receiver including, a front end having a demodulator for demodulating an incoming signal which includes a preamble and a message signal following the preamble, a wave shaping circuit coupled to said front end for producing a rectangular signal responsive to the output of said front end, and a battery saver control for periodically supplying power to the receiver under control of timing pulses, said battery saver circuit, comprising:

a valid incoming signal detector adapted to receive the output of said wave shaping circuit for detecting the baud rate of either of said preamble or said message signal and producing a first logic signal indicative of the detection of a valid incoming signal; and



a battery saver terminating means responsive to said first logic signal to generate a second logic signal for extending the time period for which power is supplied to said receiver.

279,135
COSTUME
Robert Fletcher, Los Angeles, Calif., assignor to Paramount Pictures Corporation, New York, N.Y.
Filed Jun. 7, 1982, Ser. No. 385,985
Term of patent 14 years
U.S. Cl. D2—30

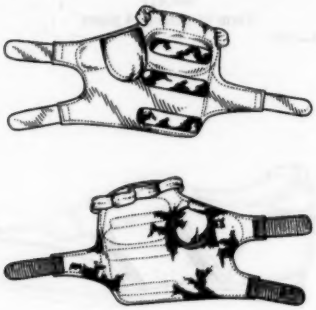
279,136
MATERNITY SKIRT OR THE LIKE
Marilyn M. Stern, Washington, D.C., assignor to Ninth Moon, Washington, D.C.
Filed Feb. 29, 1984, Ser. No. 584,875
Term of patent 14 years
U.S. Cl. D2—223

279,137
HAT
George C. Sing, 12906 - 104A Ave., Surrey, British Columbia, Canada
Filed Jul. 1, 1982, Ser. No. 394,236
Term of patent 14 years
U.S. Cl. D2—248

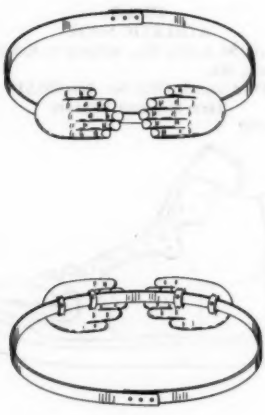
279,138
ATHLETIC SHOE WITH POCKET
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 314,136, Oct. 23, 1981, , which is a continuation-in-part of Ser. No. 116,279, Jan. 28, 1980, Pat. No. Des. 261,695. This application Dec. 13, 1982, Ser. No. 449,411
Term of patent 14 years
U.S. Cl. D2—309

279,139
ATHLETIC SHOE
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A. Inc., St. Louis, Mo.
Filed Jan. 5, 1983, Ser. No. 455,814
Term of patent 14 years
U.S. Cl. D2—310

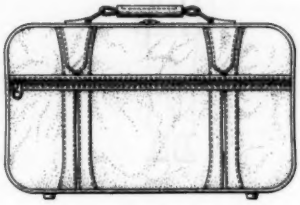
279,140
PROTECTIVE GLOVE FOR A FOOTBALL PLAYER
John C. Paulson, 1425 S. 100 West, Orem, Utah 84057
Filed Sep. 29, 1982, Ser. No. 427,392
Term of patent 14 years
U.S. Cl. D2—361



279,141
INFLATABLE BELT
Richard L. Poland, 419 W. Broadway, Long Beach, Calif. 90802
Filed Dec. 16, 1982, Ser. No. 450,564
Term of patent 14 years
U.S. Cl. D2—385



279,142
LUGGAGE
John Pulichino; Harvey J. Bomes, both of Wellesey, Mass.; John J. Migliore, East Greenwich, R.I.; Lonnie M. Smith, Fort Smith, R.I., and Wayne Schmitt, Bristol, R.I., assignors to American Tourister, Inc., Warren, R.I.
Filed Mar. 9, 1982, Ser. No. 356,595
Term of patent 14 years
U.S. Cl. D3—71



279,143
POUCH
Taichi Ueda, Yokohama, Japan, assignor to Fuji Co., Ltd., Kanagawa, Japan
Filed Jan. 28, 1983, Ser. No. 462,066
Claims priority, application Japan, Jul. 30, 1982, 57-34780
Term of patent 14 years
U.S. Cl. D3—71

279,144

EXPANDABLE HANG-UP GARMENT BAG

James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio

Filed Apr. 18, 1983, Ser. No. 486,050

Term of patent 14 years

U.S. Cl. D3—71

279,145

JEWELRY BOX

Neil Lippe, New York, N.Y., assignor to Jacmel Jewelry, Inc., New York, N.Y.

Filed May 18, 1983, Ser. No. 495,704

Term of patent 14 years

U.S. Cl. D3—75

279,146

PICTURE FRAME

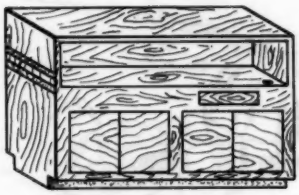
James A. McCaffrey, 1220 St. Lawrence Dr., Alpharetta, Ga. 30201

Filed Jul. 22, 1983, Ser. No. 516,100

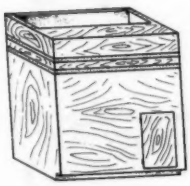
Term of patent 14 years

U.S. Cl. D6—309

279,147
RECEPTIONIST DESK
Mary E. Florsek, Kirkwood, Mo., assignor to Command Concept Company, Clayton, Mo.
Filed May 6, 1982, Ser. No. 375,479
Term of patent 14 years
U.S. Cl. D6—422

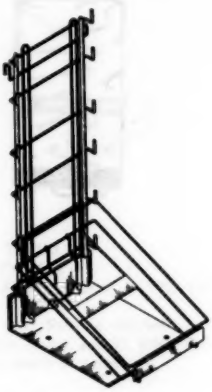


279,148
HAIR CARE UNIT
Mary E. Florsek, Kirkwood, Mo., assignor to Command Concept Company, Clayton, Mo.
Filed May 6, 1982, Ser. No. 375,477
Term of patent 14 years
U.S. Cl. D6—432

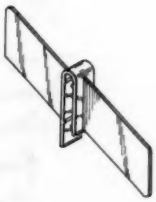


279,149
HAIR CARE UNIT
Mary E. Florsek, Kirkwood, Mo., assignor to Command Concept Company, Clayton, Mo.
Filed May 6, 1982, Ser. No. 375,480
Term of patent 14 years
U.S. Cl. D6—444

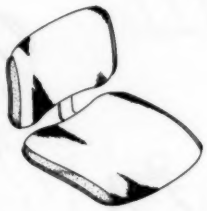
279,150
COMBINED DISPLAY RACK AND SHELF UNIT
Anthony S. Belotta, Bloomfield, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 2, 1982, Ser. No. 394,605
Term of patent 14 years
U.S. Cl. D6—462



279,151
PRODUCT SPACER FOR MERCHANDISE RACK
Peter J. Weiller, Armonk, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Feb. 10, 1983, Ser. No. 465,516
Term of patent 14 years
U.S. Cl. D6—491



279,152
COMBINED SEAT AND BACKREST UNIT
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,659
Term of patent 14 years
U.S. Cl. D6—501

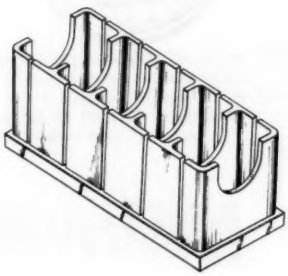


279,153
ARMREST
Robert J. Aronowitz, New York, and Bernard D. Katzanek, Brooklyn, both of N.Y., assignors to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,797
Term of patent 14 years
U.S. Cl. D6—501

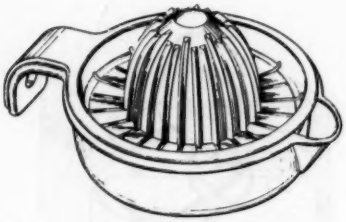
279,154
COMBINED SEAT AND BACKREST UNIT
Robert J. Aronowitz, New York, and Bernard D. Katzanek, Brooklyn, both of N.Y., assignors to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,800
Term of patent 14 years
U.S. Cl. D6—501

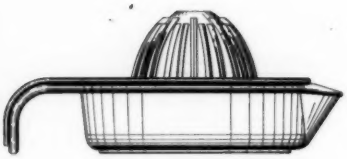
279,155
COMBINED SEAT AND BACKREST UNIT
Robert J. Aronowitz, New York, and Bernard D. Katzanek, Brooklyn, both of N.Y., assignors to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,657
Term of patent 14 years
U.S. Cl. D6—501

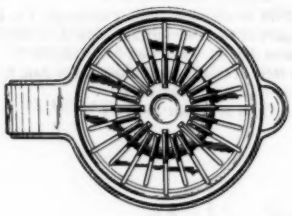
279,156
BAGEL SLICING JIG
Leonard Levine, 2978 Beechwood Blvd., Pittsburgh, Pa. 15217
Continuation-in-part of Ser. No. 455,220, Jan. 3, 1983,. This application Jul. 11, 1983, Ser. No. 512,244
The portion of the term of this patent subsequent to Jan. 8, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—43



279,157
CITRUS-FRUIT SQUEEZER
Bruno Gecchelin, Milan, Italy, assignor to F.lli Guzzini S.p.A., Recanati, Italy
Filed Feb. 9, 1982, Ser. No. 347,151
Claims priority, application Italy, Mar. 16, 1981, 21085/81[U]
Term of patent 14 years
U.S. Cl. D7—48



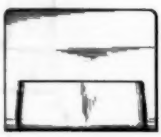




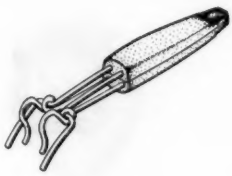
279,158
CONDIMENT DISPENSER
William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Nov. 29, 1982, Ser. No. 445,249
Term of patent 14 years
U.S. Cl. D7—54

279,159
CONDIMENT DISPENSER
William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Nov. 29, 1982, Ser. No. 445,250
Term of patent 14 years
U.S. Cl. D7—57

279,160
TACO HOLDER
Dale A. Hunt, 7940 Sunfield Ct., Indianapolis, Ind. 46224
Filed Feb. 11, 1982, Ser. No. 348,204
Term of patent 14 years
U.S. Cl. D7—76



279,161
HAND-HELD GRIPPING TOOL FOR COOKING UTENSILS
Mel J. Gould, 19125 Haynes St., Unit #6, Reseda, Calif. 91335
Filed Sep. 24, 1982, Ser. No. 422,852
Term of patent 14 years
U.S. Cl. D7—393

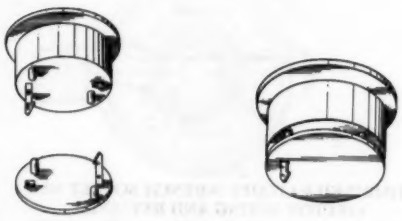


279,162
FOOD SHREDDING DEVICE
John N. Samuel, 2212 Sheridan St., Hyattsville, Md. 20782
Filed Feb. 3, 1983, Ser. No. 463,802
Term of patent 14 years
U.S. Cl. D7—412

279,163
COMBINED RATCHET WRENCH SOCKET NUT EJECTOR SPRING AND RETAINER
Howard D. Lye, 317 N. 16th East, Riverton, Wyo. 82501
Filed Jul. 30, 1982, Ser. No. 403,559
Term of patent 14 years
U.S. Cl. D8—25

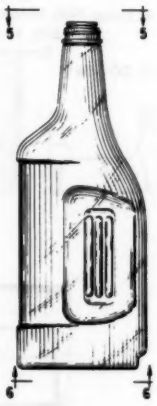
279,164
CONCRETE REINFORCING ROD SPACER
Dinna L. Mitchell, and Howard Hewitt, both of #204-1107 Homer St., Vancouver, B.C., Canada (V6R 2Y1)
Filed May 9, 1984, Ser. No. 608,452
Term of patent 14 years
U.S. Cl. D8—354

279,165
SWIMMING POOL COVER POSITIONING UNIT
Edward R. Smith, Blairstown, N.J., assignor to Sealed Air Corporation, Fair Lawn, N.J.
Filed Nov. 26, 1982, Ser. No. 444,709
Term of patent 14 years
U.S. Cl. D8—354



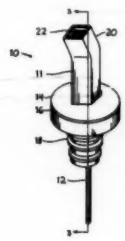
279,166
PRESSURIZED DISPENSING CONTAINER
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan
Filed Jun. 30, 1982, Ser. No. 393,779
Term of patent 14 years
U.S. Cl. D9—300

279,167
BOTTLE
Jack E. Haney, Norcross; Sue A. Mager, and William B. Mikolaitis, both of Lilburn, all of Ga., assignors to Standard Oil Company (Indiana), Chicago, Ill.
Filed Dec. 21, 1982, Ser. No. 451,773
Term of patent 14 years
U.S. Cl. D9—378



279,168
PACKAGING CONTAINER OR THE LIKE
David Goldsmith, Chappaqua, N.Y., assignor to Erica Goldsmith Trust and Evan Goldsmith Trust
Filed Dec. 8, 1982, Ser. No. 448,442
Term of patent 14 years
U.S. Cl. D9—429

279,169
DISPENSING CLOSURE
Wayne R. Banasik, 24N064 Lakeside Dr., Lake Zurich, Ill. 60047
Filed Dec. 7, 1981, Ser. No. 328,467
Term of patent 14 years
U.S. Cl. D9—447



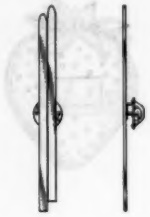
279,170
LOOSE FILL PACKING ELEMENT
Stephen L. Witte, Memphis, Tenn., assignor to Inter-Pac Packaging Corporation, Memphis, Tenn.
Filed Aug. 17, 1982, Ser. No. 408,802
Term of patent 14 years
U.S. Cl. D9—456

279,171
DIGITAL CLOCK
Bernard Mermelstein, c/o M. Z. Berger & Co., Inc., 20 W. 37th St., New York, N.Y. 10018
Filed Mar. 15, 1982, Ser. No. 358,114
Term of patent 14 years
U.S. Cl. D10—9

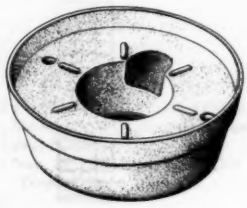
279,172
WRIST WATCH
Jörg Hysek, Nyon, Switzerland, assignor to Jean Lassale S.A., Carouge, Switzerland
Filed Jun. 20, 1983, Ser. No. 505,681
Claims priority, application Hague, Dec. 20, 1982, 72.826
Term of patent 14 years
U.S. Cl. D10—32

279,173
COUNTDOWN TIMER
William P. Ketcham, 47 Sinawoy Rd., Cos Cob, Conn. 06807
Filed Jan. 20, 1983, Ser. No. 459,372
Term of patent 14 years
U.S. Cl. D10—40

279,174
SKI PIN
Gary R. Wolfberg, Dallas, Tex., assignor to G. R. Marketing, Inc., Cerritos, Calif.
Filed Feb. 22, 1983, Ser. No. 445,926
Term of patent 14 years
U.S. Cl. D11—47



279,175
WATER RESERVOIR FOR POTTED PLANTS
Krister Eklöf, Bastugatan 17, S-117 25 Stockholm, Sweden
Filed Oct. 13, 1983, Ser. No. 541,744
Claims priority, application Sweden, Apr. 14, 1983, 83-1055
Term of patent 14 years
U.S. Cl. D11—164

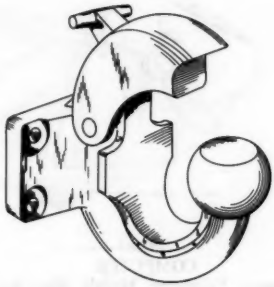


279,176
TRICYCLE FOR CHILDREN
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Filed Mar. 28, 1983, Ser. No. 479,434
Term of patent 14 years
U.S. Cl. D12—112

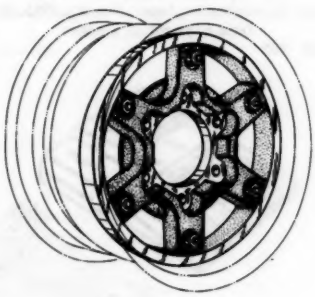
279,177
TIRE
Peter J. Walker, Bradford-on-Avon, England, assignor to Avon Tyres Limited, Great Britain
Filed Jan. 31, 1983, Ser. No. 462,683
Claims priority, application United Kingdom, Aug. 5, 1982, 1008167
Term of patent 14 years
U.S. Cl. D12—136

279,178
VEHICLE TIRE
Masao Nakamura; Hiroshi Kojima, both of Tokyo, and Hideaki Nishio, Saitama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed Jun. 27, 1983, Ser. No. 507,646
Claims priority, application Japan, Jan. 7, 1983, 58-67
Term of patent 14 years
U.S. Cl. D12—151

279,179
DUPLEX HITCH
Ernest A. Landry, Jr., 50 Bennett St., Lynn, Mass. 01905
Filed Jun. 7, 1982, Ser. No. 385,450
Term of patent 14 years
U.S. Cl. D12—162

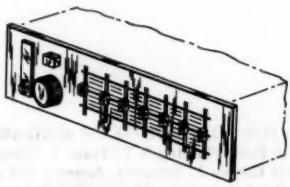


279,180
VEHICLE WHEEL CENTER
Raymond J. Hedlund, 1250 Pinecreek Way, Concord, Calif. 94520
Filed Dec. 9, 1982, Ser. No. 448,155
Term of patent 14 years
U.S. Cl. D12—211

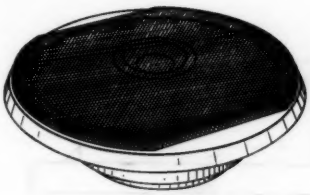


279,181
PORTABLE BATTERY CHARGER OR SIMILAR ARTICLE
Bruce A. Claxton, Coral Springs, Fla., and Sylvia Ramos, Royal Oak, Mich., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 28, 1983, Ser. No. 480,048
Term of patent 14 years
U.S. Cl. D13—5

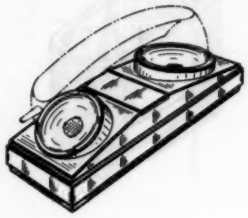
279,182
FRONT PANEL FOR A GRAPHIC EQUALIZER OR SIMILAR ARTICLE
William B. Shenk, Jr., Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sep. 12, 1983, Ser. No. 531,310
Term of patent 14 years
U.S. Cl. D14—1



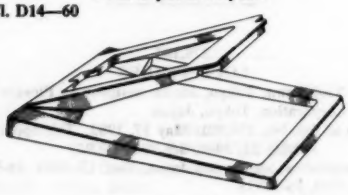
279,183
LOUDSPEAKER
Katsuya Yoshikawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Division of Ser. No. 379,191, May 17, 1982,. This application May 22, 1984, Ser. No. 612,937
Claims priority, application Japan, Dec. 17, 1981, 56-55972; Dec. 17, 1981, 56-55973
Term of patent 14 years
U.S. Cl. D14—30

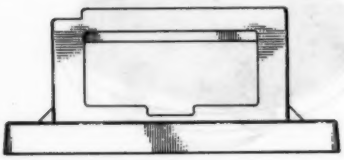


279,184
TELEPHONE ACOUSTIC COUPLER BASE
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 30, 1982, Ser. No. 431,143
Claims priority, application Japan, Apr. 7, 1982, 57-15087
Term of patent 14 years
U.S. Cl. D14—57



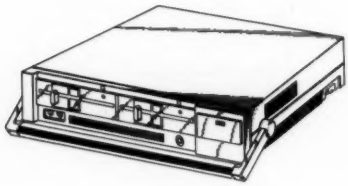
279,185
STAND FOR A TELEPHONE OR SIMILAR ARTICLE
Christian J. Felix, Flushing, N.Y.; Frank V. Gates, Succasunna, N.J., and Gordon E. Sylvester, Jamaica, N.N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Oct. 25, 1982, Ser. No. 436,345
Term of patent 14 years
U.S. Cl. D14—60





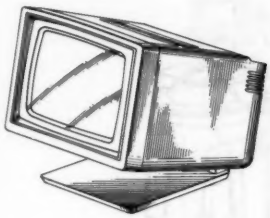
279,186
COMBINED PEN, WATCH AND RADIO
Tse Tung, and Sou K. Ko, both of 7th Fl., No. 8, La. 473, Kuang Fu S. Rd., Taipei, Taiwan
Filed Jul. 20, 1982, Ser. No. 400,519
Term of patent 14 years
U.S. Cl. D14—68

279,187
COMPUTER
Tomoki Tsumura, Yokohama; Hiroshi Maruoka, Fujisawa; Toshio Asaji, Yokohama, and Mitsuru Yamamoto, Yamato, all of Japan, assignors to Panafacom Limited, Kanagawa, Japan
Filed Jan. 24, 1983, Ser. No. 460,637
Claims priority, application Japan, Jul. 22, 1982, 57-33200
Term of patent 14 years
U.S. Cl. D14—100



279,188
DESK ELECTRONIC COMPUTER
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 29, 1983, Ser. No. 555,955
Claims priority, application Japan, May 31, 1983, 58-23572
Term of patent 14 years
U.S. Cl. D14—100

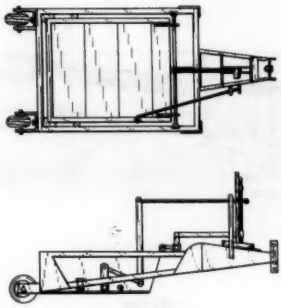
279,189
DISPLAY
Tomoki Tsumura, Yokohama; Hiroshi Maruoka, Fujisawa; Toshio Asaji, Yokohama, and Mitsuru Yamamoto, Yamato, all of Japan, assignors to Panafacom Limited, Kanagawa, Japan
Filed Jan. 21, 1983, Ser. No. 459,942
Claims priority, application Japan, Jul. 22, 1982, 57-33202
Term of patent 14 years
U.S. Cl. D14—113



279,190
KEYBOARD
Tomoki Tsumura, Yokohama; Hiroshi Maruoka Fujisawa; Toshio Asaji, Yokohama, and Mitsuru Yamamoto, Yamato, all of Japan, assignor to Panafacom Limited, Kanagawa, Japan
Filed Jan. 21, 1983, Ser. No. 459,943
Claims priority, application Japan, Jul. 22, 1982, 57-33201
Term of patent 14 years
U.S. Cl. D14—100

279,191
KEYBOARD
Tadashi Nakamura, Tokyo, and Yutaka Nakano, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Mar. 25, 1983, Ser. No. 478,724
Claims priority, application Japan, Oct. 14, 1982, 57-46687
Term of patent 14 years
U.S. Cl. D14—100

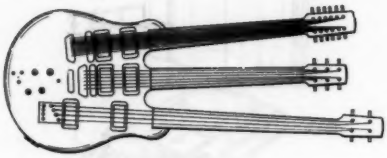
279,192
COMBINED DIRT SCRAPER AND SPREADER
Ray A. Marler, 2432 Mansfield, Del City, Okla. 73115
Filed May 24, 1983, Ser. No. 497,519
Term of patent 14 years
U.S. Cl. D15—13



279,193
FRONT RIFLE SCOPE SHADE
Charles F. Surber, P.O. Box 684, Marfa, Tex. 79843
Division of Ser. No. 190,433, Sep. 24, 1980, abandoned. This application Dec. 30, 1982, Ser. No. 454,837
Term of patent 14 years
U.S. Cl. D16—132

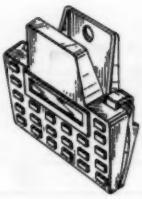
279,194
FRONT RIFLE SCOPE SHADE
Charles F. Surber, P.O. Box 684, Marfa, Tex. 79843
Continuation-in-part of Ser. No. 190,433, Sep. 24, 1980, abandoned. This application Dec. 30, 1982, Ser. No. 454,838
Term of patent 14 years
U.S. Cl. D16—132

279,195
THREE-NECKED GUITAR
Glenn E. Perkins, Denver, Colo., assignor to Max L. Wymore, Denver, Colo., a part interest
Filed Jan. 6, 1983, Ser. No. 455,934
Term of patent 14 years
U.S. Cl. D17—15



279,196
ELECTRONIC CALCULATOR WITH WATCH
Shigeru Kurozumi, and Masaji Sawada, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 7, 1983, Ser. No. 473,023
Term of patent 14 years
U.S. Cl. D18—2

279,197
CALCULATOR CLIP
Danny C. Chi Hung, Hong Kong, Hong Kong, assignor to Dah Sun Electronics Company Limited, Hong Kong, Hong Kong
Filed Oct. 5, 1983, Ser. No. 539,245
Claims priority, application United Kingdom, Apr. 14, 1983, 1012494
Term of patent 14 years
U.S. Cl. D18—2



279,198
EMBOSSING TOOL
Dane Pedersen, Alameda, Calif., assignor to Esselte Dymo N V, Belgium
Filed Nov. 24, 1982, Ser. No. 443,538
Claims priority, application United Kingdom, May 25, 1982, 1006924
Term of patent 14 years
U.S. Cl. D18—19

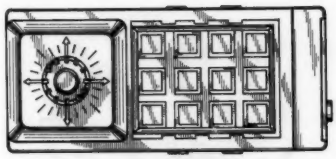
279,199
FONT OF TYPE
William M. Wiley, and Mary H. Wiley, both of 1855 E. 700 South, Lebanon, Ind. 46052
Filed Jun. 27, 1983, Ser. No. 507,735
Term of patent 14 years
U.S. Cl. D18—30

279,200
RECIPE MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 20, 1983, Ser. No. 459,699
Term of patent 14 years
U.S. Cl. D19—91

279,201
FLOOR STAND DISPLAY CARD HOLDER
Bernard E. Shuman, Merrick, N.Y., assignor to Eastern Electrical Equipment Co., Inc., Hicksville, N.Y.
Filed Apr. 25, 1983, Ser. No. 488,129
Term of patent 14 years
U.S. Cl. D20—43

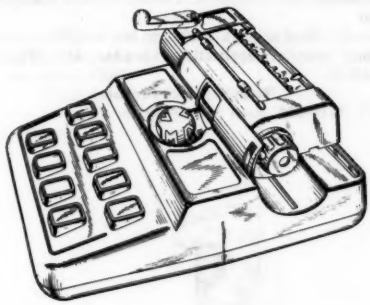
279,202
CONTROL FOR A VIDEO GAME OR THE LIKE
Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.
Filed Jan. 6, 1983, Ser. No. 456,262
Term of patent 14 years
U.S. Cl. D21—48

279,203
CONTROL FOR A VIDEO GAME
Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.
Filed Apr. 25, 1983, Ser. No. 487,916
Term of patent 14 years
U.S. Cl. D21—48



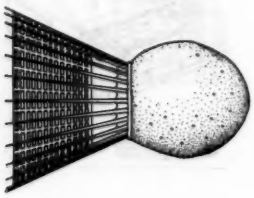
279,204
TOY CASH REGISTER
Pietro Catelli, Como, Italy, assignor to Artsana S.P.A., Italy
Filed Jul. 28, 1983, Ser. No. 518,157
Term of patent 14 years
U.S. Cl. D21—124

279,205
TOY TYPEWRITER
Pietro Catelli, Como, Italy, assignor to Artsana S.P.A., Italy
Filed Jul. 28, 1983, Ser. No. 518,154
Term of patent 14 years
U.S. Cl. D21—127



279,206
EXERCISE BICYCLE
David B. Smith, Mercer Island, and Randolph F. Miller, Mt. Vernon, both of Wash., assignors to Precor, Incorporated, Redmond, Wash.
Filed Jan. 19, 1984, Ser. No. 572,565
Term of patent 14 years
U.S. Cl. D21—194

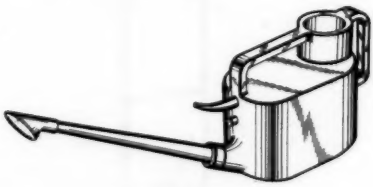
279,207
FOAM-HEAD SHUTTLECOCK
John Hand, Phippen House, off Summer St., Manchester, Mass. 01944
Continuation-in-part of Ser. No. 230,032, Jan. 30, 1981,. This application Jan. 17, 1983, Ser. No. 458,523
Term of patent 14 years
U.S. Cl. D21—207



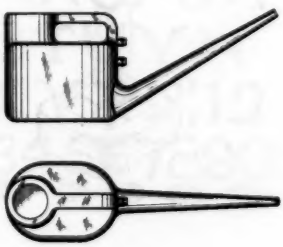
279,208
GOLF TEE GUIDE
Fred Schuster, 653 Donegal Dr., London, Ontario, Canada (N6H 3H6)
Filed May 31, 1983, Ser. No. 499,520
Claims priority, application Canada, Jan. 31, 1983, 31-01-83-25
Term of patent 14 years
U.S. Cl. D21—234

279,209
FISHING LURE
Loyce W. Hevrin, 11656 Merritt St., Castroville, Calif. 95012
Filed Apr. 11, 1983, Ser. No. 483,472
Term of patent 14 years
U.S. Cl. D22—28

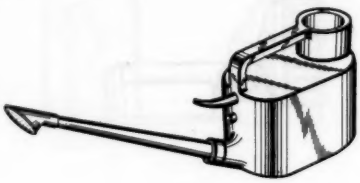
279,210
WATERING CAN
Arthur R. Carlson, Melbourne, Australia, assignor to Brian Davis and Company Proprietary Limited, Scoresby, Australia
Filed May 2, 1983, Ser. No. 490,308
Claims priority, application Australia, Nov. 12, 1982, 2127/82; Nov. 12, 1982, 2129/82; Nov. 12, 1982, 2130/82; Nov. 12, 1982, 2131/82; Nov. 12, 1982, 2132/82
Term of patent 14 years
U.S. Cl. D23—11



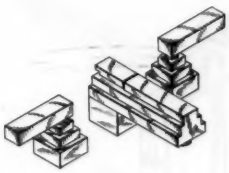
279,211
WATERING CAN
Arthur R. Carlson, Melbourne, Australia, assignor to Brian Davis and Company Proprietary Limited, Scoresby, Australia
Filed May 2, 1983, Ser. No. 490,309
Claims priority, application Australia, Mar. 22, 1983, 3300/83
Term of patent 14 years
U.S. Cl. D23—11



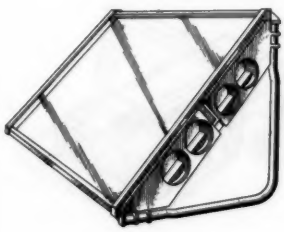
279,212
WATERING CAN
Arthur R. Carlson, Melbourne, Australia, assignor to Brian Davis and Company Proprietary Limited, Scoresby, Australia
Filed May 2, 1983, Ser. No. 490,310
Claims priority, application Australia, Nov. 12, 1982, 2126/82; Nov. 12, 1982, 2129/82; Nov. 12, 1982, 2130/82; Nov. 12, 1982, 2131/82; Nov. 12, 1982, 2132/82
Term of patent 14 years
U.S. Cl. D23—11



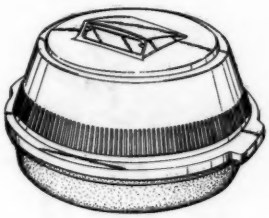
279,213
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates Inc., Long Island City, N.Y.
Filed Apr. 25, 1983, Ser. No. 488,579
Term of patent 14 years
U.S. Cl. D23—25



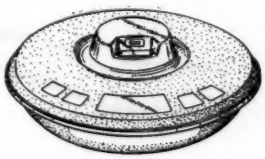
279,214
SOLAR COLLECTOR
David J. Hanson, River Rd., New Castle, Me. 04553
Filed Aug. 30, 1982, Ser. No. 413,184
Term of patent 14 years
U.S. Cl. D23—72



279,215
HUMIDIFER
Joseph R. Mango, Midlothian, and Donald G. Wolfe, Lake Barrington, both of Ill., assignors to Gerber Products Company, Fremont, Mich.
Filed Sep. 16, 1982, Ser. No. 418,910
Term of patent 14 years
U.S. Cl. D23—146



279,216
VAPORIZER
Joseph R. Mango, Midlothian, and Donald G. Wolfe, Lake Barrington, both of Ill., assignors to Gerber Produets Company, Fremont, Mich.
Filed Nov. 16, 1983, Ser. No. 552,226
Term of patent 14 years
U.S. Cl. D23—148

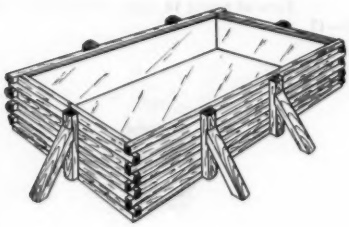


279,217
AIR-IN-LINE SENSOR FOR FLUID DELIVERY SYSTEMS OR THE LIKE
Robert B. Truitt, La Jolla; Clifford C. Cox, Irvine, and Joseph J. Manno, San Diego, all of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Apr. 26, 1982, Ser. No. 372,002
Term of patent 14 years
U.S. Cl. D24—17

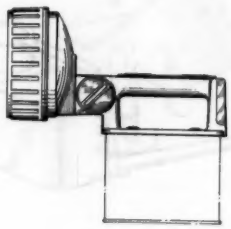
279,218
MULTIPLE NIPPLE PACIFIER
Emmett F. Carpel, 2683 E. Lake of the Isles, Minneapolis, Minn. 55408
Filed Sep. 22, 1982, Ser. No. 421,240
Term of patent 14 years
U.S. Cl. D24—46

279,219
BREATHING DEVICE FOR ATHLETES
Raymond J. Hanlon, 4 Wildflower Rd., Barrington, R.I. 02806
Filed Apr. 12, 1982, Ser. No. 367,636
Term of patent 14 years
U.S. Cl. D24—62

279,220
SWIMMING POOL
Jack A. Freeman, R.D. #2, Box 613, Hollidaysburg, Pa. 16648
Filed Aug. 12, 1981, Ser. No. 292,179
Term of patent 14 years
U.S. Cl. D25—2

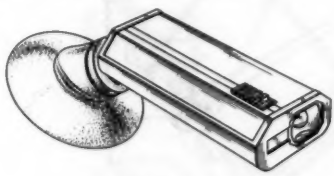


279,221
EMERGENCY LANTERN
John F. Schosser, New Fairfield, Conn.; Charles M. Dole, Purdys, N.Y., and Walter P. Koda, Newtown, Conn., assignors to Duracell Inc., Bethel, Conn.
Filed Feb. 7, 1983, Ser. No. 464,458
Term of patent 14 years
U.S. Cl. D26—44

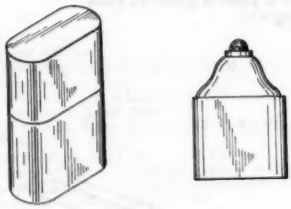


279,222
PORTABLE LIGHT
John H. Drane, London, England, assignor to Duracell Inc., Bethel, Conn.
Filed Nov. 6, 1981, Ser. No. 318,783
Claims priority, application United Kingdom, May 13, 1981, 1000442
Term of patent 14 years
U.S. Cl. D26—44

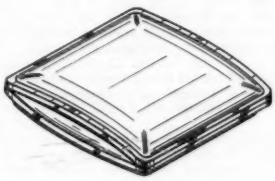
279,223
PORTABLE VEHICLE LIGHT
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,860
Term of patent 14 years
U.S. Cl. D26—60



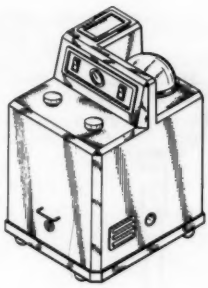
279,224
FRAGRANCE APPLICATOR
Irving M. Wolbrom, Great Neck, N.Y., assignor to Presentation Vehicles, Ltd., New York, N.Y.
Filed Jan. 10, 1983, Ser. No. 457,061
Term of patent 14 years
U.S. Cl. D28—7



279,225
COSMETIC BOX
Alain Chevassus, Sceaux, France, assignor to Lefebure Isolants Reunis, Rungis, France
Filed Apr. 26, 1982, Ser. No. 371,577
Claims priority, application France, Dec. 24, 1981, 814469
Term of patent 14 years
U.S. Cl. D28—83



279,226
DISPENSARY CABINET FOR CARPET CLEANERS AND THE LIKE
Anthony Salmon, Toronto, Canada, assignor to Salmon Sanitation Market Place Inc., Mississauga, Canada
Filed Apr. 20, 1982, Ser. No. 370,279
Claims priority, application Canada, Oct. 28, 1981, 28-10-81-2
Term of patent 14 years
U.S. Cl. D32—1



279,227
COMBINED FILTER AND VACUUM HEAD FOR CLEANING UNDERWATER SURFACES
Kenneth E. Price, 1534 Channelwood Dr., Whittier, Calif. 90601
Division of Ser. No. 205,873, Nov. 10, 1980, Pat. No. Des. 271,816. This application May 11, 1983, Ser. No. 493,723
Term of patent 14 years
U.S. Cl. D32—31

279,228

ICE SCRAPING TOOL

Kenneth E. Peterson, Minneapolis, Minn., assignor to IK Products, Inc., Minneapolis, Minn.

Filed Feb. 28, 1983, Ser. No. 470,207

Term of patent 14 years

U.S. Cl. D32—49

279,229

MINI TRAVEL IRON

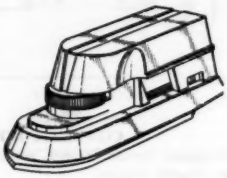
Lam-Kwan Lun, Kowloon, Hong Kong, assignor to Wing Sang Bakelite Electrical Manufactory Limited, Hong Kong, Hong Kong

Filed Feb. 22, 1983, Ser. No. 468,199

Claims priority, application United Kingdom, Dec. 2, 1982, 1010077

Term of patent 14 years

U.S. Cl. D32—70



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Ayerst, McKenna & Harrison, Inc.: *See—*
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Minchak, Robert J.; and Schenk, William N., 4,522,902, Cl. 429-252.000.

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Bachman, Wesley J., to Dickey-john Corporation. Spreader control. 4,523,280, Cl. 364-424.000.

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Bailen, Eddie H.; Rasmussen, David H.; and Johnson, William C., to AG-Bag Corporation. Method and apparatus for manufacturing an agricultural bag. 4,522,615, Cl. 493-37.000.

Bailey, Donald L., to Marquest Medical Products, Inc. Lyophilizing and forming biologicals having a predetermined unit dosage. 4,521,975, Cl. 34-5.000.

Bains, William R.; and Sumrall, Calhoun W., to Ford Aerospace & Communications Corp. Ram air steering system for a guided missile. 4,522,357, Cl. 244-3.220.

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Baker, Anthony C.; and Pinkham, Thomas A., to Interpace Corporation. Line-past insulator support system, method of assembly thereof, and clamp for use therein. 4,523,054, Cl. 174-45.00R.

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Bancroft, Charles F.; Brown, Thomas B.; Bullock, Peter W.; and Sutter, Leroy V., Jr., to Hughes Aircraft Company. Method and apparatus for forming a ball at the end of a wire. 4,523,071, Cl. 219-56.220.

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Neukam, Theo; Brauer, Wolfgang; and Korte, Siegfried, 4,522,764, Cl. 260-456.00R.

Braun Aktiengesellschaft: *See—*
Schwarz, Gerhard; and Bergk, Gunther, 4,523,139, Cl. 320-40.000.

Braun, Frank D.; Witt, Walter; and Putra, Stanislav, to IPCO Corporation. Articulator for holding dental models. 4,522,591, Cl. 433-60.000.

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Keck, Daniel H.; Braun, Ralph V.; and Majors, Mark B., 4,522,863, Cl. 428-196.000.

Brazelton, Carl L., to Stran Corporation. Mixing and feeding apparatus. 4,522,502, Cl. 366-160.000.

Bregatta, Ray J., to Pellon Corporation. Expandable chest piece and method of constructing a garment using same. 4,521,921, Cl. 2-93.000.

Brennan, John F., to UOP Inc. Process for oxidizing a gas comprising carbon monoxide or an hydrocarbon. 4,522,792, Cl. 423-213.500.

Briggs, Jerald E.; and Pfeutzenreuter, Henry, to American Can Company. Apparatus and method for producing multilayered laminates. 4,522,775, Cl. 264-173.000.

Briggs & Stratton Corp.: *See—*
Santi, John D., 4,522,080, Cl. 74-445.000.

Brister, Eneas E.; and Williams, Frederick P., to Monarch Marking Systems, Inc. Composite label web and method of making and method of applying labels. 4,522,672, Cl. 156-238.000.

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Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,522,943, Cl. 514-183.000.

Britax-Kolb GmbH & Co.: *See—*
Ernst, Hans-Hellmut, 4,522,350, Cl. 242-107.40A.

Britax Weathershields Limited: *See—*
Fisher, Sidney E., 4,521,937, Cl. 16-332.000.

British American Bank Note Inc.: *See—*
Small, Edward A.; and Wright, Geoff C., 4,522,428, Cl. 283-82.000.

Brittain, David R.; and Wood, Robin, to Imperial Chemical Industries PLC. 1'-Substituted-spiro[pyrrolidine-3,3'-indoline]-2,2',5-triones. 4,523,021, Cl. 548-410.000.

Brody, Harry, to Imperial Chemical Industries PLC. Process of melt spinning polypropylene and novel rough surfaced fibres produced thereby. 4,522,884, Cl. 428-400.000.

Brolin, Hans, to AB Perma System. Bearing bracket for outer-wall venetian blinds. 4,522,244, Cl. 160-170.000.

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Markbreiter, Stephen J.; and Schorr, Hans P., 4,522,636, Cl. 55-23.000.

Brooks, Austin E., Jr., to Wabash College. Imaging method of making a raised line facsimile of a photographic image. 4,522,914, Cl. 430-320.000.

Brothers, Lance E.: *See—*
Rao, S. Prabhakara; Brothers, Lance E.; and Brake, Bobby G., 4,522,653, Cl. 106-90.000.

Broussard, Alphe. Collapsible, movable apparatus for supporting health-sports devices. 4,522,394, Cl. 273-1.50R.

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Esrom, Hilmar, 4,522,898, Cl. 429-120.000.

Brown, Bruce; and Brown, William C. Paper feeding mechanism. 4,522,386, Cl. 271-147.000.

Brown, Michael J.: *See—*
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,523,004, Cl. 528-76.000.

Brown, Richard E.: *See—*
Musser, John H.; and Brown, Richard E., 4,522,947, Cl. 514-293.000.

Brown, Roger H.; Chow, Kuen; Goodwin, Norman W.; and Grinberg, Jan, to Hughes Aircraft Company. Temperature gradient zone melting apparatus. 4,523,067, Cl. 219-10.49R.

Brown, Sand T.: *See—*
Dechow, Fred J.; Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., 4,522,836, Cl. 426-271.000.

Brown, Thomas B.: *See—*
Bancroft, Charles F.; Brown, Thomas B.; Bullock, Peter W.; and Sutter, Leroy V., Jr., 4,523,071, Cl. 219-56.220.

Brown, Thomas H., to Smith Kline & French Laboratories Limited. Process and nitroaminopyrimidone intermediates for histamine H_2-antagonists. 4,523,015, Cl. 544-320.000.

Brown University: *See—*
Pfost, Dale R., 4,523,319, Cl. 372-54.000.

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Brown, William H.; Starkweather, James A.; and Humphreys, Hugh M., to Gould Computer Systems Inc. Synchronous communications multiplexer. 4,523,310, Cl. 370-112.000.

Brown, William M.; and Lindquist, James R., to Astech, Inc. Power line carrier multi telephone extension system for full duplex conferencing and intercom between telephones. 4,523,307, Cl. 370-30.000.

Bruch, Charles A.: *See—*
Gigliotti, Michael F. X., Jr.; Yang, Swe-Wong; Jackson, Melvin R.; Bruch, Charles A.; and Nguyen-Dinh, Xuan, 4,522,664, Cl. 148-404.000.

Brunn, Oswald. Davenport convertible to a double bed or a single bed. 4,521,927, Cl. 5-37.00R.

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Swisher, Steven L., 4,522,347, Cl. 242-84.50A.

Brust, John E. Filter apparatus. 4,522,717, Cl. 210-238.000.

Brzuska, Lothar: *See—*
Altmann, Gerhard; Alber, Friedrich; and Brzuska, Lothar, 4,523,171, Cl. 336-96.000.

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Erdmann, Jurgen; Buchholz, Karl O.; and Knappe, Hartmut, 4,523,251, Cl. 361-152.000.

Buchwitz, Mayleta: *See—*
Humason, Dan C.; Buchwitz, Mayleta; and Higgins, Theodore E., 4,522,864, Cl. 428-201.000.

Budd Company, The: *See—*
Dean, Walter C., II, 4,522,304, Cl. 206-591.000.
Degner, Frederick M., 4,522,377, Cl. 266-196.000.

Buffet, Jacques, to Cardiofrance Compagnie Francaise D'Electrocardiologie. Method for determining parameter values of an implanted programmable pacemaker. 4,522,208, Cl. 128-419.0PT.

Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, to Stromberg-Carlson Corporation. Telephone concentrator switch arrangement. 4,523,308, Cl. 370-56.000.

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Bancroft, Charles F.; Brown, Thomas B.; Bullock, Peter W.; and Sutter, Leroy V., Jr., 4,523,071, Cl. 219-56.220.

Bunch, Earnest B., Jr. Timing adjustment mechanism for continuous form stationery folding machine. 4,522,619, Cl. 493-415.000.

Bunker, Robert L. Dental floss applicator. 4,522,216, Cl. 132-92.00R.

Burgan, Thomas J., to Chicago Rawhide Mfg. Co. Fluid seals with self-venting auxiliary lips. 4,522,411, Cl. 277-134.000.

Burge, Joseph C.; and Bathori, Julius, to General Electric Company. Compressor casing. 4,522,559, Cl. 415-196.000.

Burger, Kurt; and Gruner, Heiko, to Robert Bosch GmbH. Thin-film strain gauge. 4,522,067, Cl. 73-862.650.

Burger, Norman J.: *See—*
Goldfarb, Adolph E.; Everitt, Delmar K.; and Burger, Norman J., 4,522,606, Cl. 446-433.000.

Burger, Rainer; Bittl, Gerhard; and Kobler, Ingo, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Inking roller for the inking equipment of a rotary press. 4,522,124, Cl. 101-350.000.

Burger, Walter L.: *See—*
Elias, Moenes L.; and Burger, Walter L., 4,522,683, Cl. 156-666.000.

Burk, Emmett H., Jr.: *See—*
Yoo, Jin S.; Karch, John A.; Poss, Richard F.; and Burk, Emmett H., Jr., 4,522,937, Cl. 502-302.000.

Burke, John F.: *See—*
Yannas, Ioannis V.; Burke, John F.; and Stasikelis, Peter J., 4,522,753, Cl. 260-123.700.

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Ley, David A.; and Burkhard, Herbert, 4,522,973, Cl. 524-555.000.

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Heidmann, Kurt R.; Canale, Jon S.; and Burkhardt, Hans, 4,522,287, Cl. 188-73.350.

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Gamblin, Rodger L., 4,523,202, Cl. 346-75.000.

Burns, Gary D.; and Schaber, Scott D., to Sperry Corporation. Read error occurrence detector for error checking and correcting system. 4,523,314, Cl. 371-38.000.

Burpo, Steven J.: *See—*
Ares, Roland A.; Burpo, Steven J.; and Schaeffer, Wayne G., 4,522,037, Cl. 62-196.400.

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Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., 4,522,846, Cl. 427-54.100.
Sprenkle, George J., 4,521,959, Cl. 29-741.000.

Burton, Christopher P.; and Johnson, Kenneth C., to International Computers Limited. Data processing network. 4,523,192, Cl. 340-825.570.

Busching, Forrest B.: *See—*
Chen, Tyen C.; Busching, Forrest B.; Hale, William D.; and Kristoffersen, Bjorn R., 4,521,925, Cl. 4-362.000.

Bushnell, Dennis: *See—*
Barnwell, Richard; Bushnell, Dennis; Nagamatsu, Henry T.; Bahi, Lakhdar; and Ross, Janet, 4,522,360, Cl. 244-204.000.

Bushnell, James D.: *See—*
Achia, Biddanda U.; Shaw, David H.; and Bushnell, James D., 4,522,710, Cl. 208-349.000.

Buttery, Ronald G.; Ling, Louisa C.; and Juliano, Bienvenido O., to United States of America, Agriculture; and International Rice Research Institute, Republic of the Philippines. 2-Acetyl-1-pyrroline and its use for flavoring foods. 4,522,838, Cl. 426-537.000.

Buttinoni, Ada: *See—*
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,522,944, Cl. 514-222.000.

Byrne, James E.: *See—*
Heilhecker, Joseph K.; and Byrne, James E., 4,522,450, Cl. 303-9.000.

C. G. Bevan Associates Limited: *See—*
Bevan, Christopher G., 4,522,772, Cl. 264-71.000.

C-I-L Inc.: *See—*
Marz, Horst F., 4,522,125, Cl. 102-313.000.

C. R. Bard, Inc.: *See—*
Bare, Rex O.; and Robinson, Earl F., 4,522,211, Cl. 128-640.000.

C. R. Medd & Sons: *See—*
Medd, Ronald A., 4,522,505, Cl. 366-343.000.

Cain, John D., to NCR Canada Ltd - NCR Canada Ltee. Banking system and method. 4,523,330, Cl. 382-7.000.

Caines, R. Scott, to American Hoechst Corporation. Process for manufacture of tamper-resistant polyester credit cards. 4,522,670, Cl. 156-220.000.

Caldicott, Jack R.: *See—*
Levinson, Samuel H.; and Caldicott, Jack R., 4,523,193, Cl. 340-825.690.

Calundann, Gordon W.; Charbonneau, Larry F.; and Benicewicz, Brian C., to Celanese Corporation. Melt processable polyester capable of forming an anisotropic melt comprising a relatively low concentration of 6-oxy-2-naphthoyl moiety-4-benzoyl moiety, 1,4-dioxyphenylene moiety, isophthaloyl moiety and terephthaloyl moiety. 4,522,974, Cl. 524-605.000.

Campau, Daniel N. Fluidic level control system. 4,522,228, Cl. 137-393.000.

Campbell, Donald C. Ramp-operated mechanical gate systems. 4,521,992, Cl. 49-269.000.

Campbell, John R.; and Williams, Robert E., Jr., to General Electric Company. Ionically cross-linked siloxane polymers. 4,523,002, Cl. 528-26.000.

Campbell, R. Clark; and Townsend, D. Ronald, to Corporation of the Town of Vaughan, The; and University of Ottawa, The. Flow restrictor. 4,522,533, Cl. 405-36.000.

Campbell Soup Company: *See—*
Hildebolt, William M., 4,522,015, Cl. 53-425.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Peddle, Darren C., 4,522,380, Cl. 269-71.000.

Canale, Jon S.: *See—*
Heidmann, Kurt R.; Canale, Jon S.; and Burkhardt, Hans, 4,522,287, Cl. 188-73.350.

Canon Denshi Kabushiki Kaisha: *See—*
Toshimitsu, Naohiko; and Fujimura, Masayuki, 4,523,244, Cl. 360-129.000.

Canon Kabushiki Kaisha: *See—*
Iwashita, Tomonori; and Fukahori, Hidehiko, 4,522,477, Cl. 354-173.100.
Kamiya, Osamu; and Sekimura, Nobuyuki, 4,522,485, Cl. 355-11.000.
Kawabata, Takashi; Shinoda, Nobuhiko; and Sakai, Shinji, 4,522,480, Cl. 354-468.000.
Masunaga, Makoto, 4,522,492, Cl. 356-1.000.
Mitsuhashi, Yasuo; and Ohsaki, Ichiro, 4,522,907, Cl. 430-102.000.
Sakurai, Atsushi, 4,523,298, Cl. 364-900.000.
Tsunekawa, Tokuichi, 4,523,101, Cl. 250-578.000.
Yamada, Masanori; and Yoshikawa, Ryoichi, 4,522,479, Cl. 354-413.000.

Cape Cod Research, Inc.: *See—*
Walsh, Myles A., 4,522,897, Cl. 429-119.000.

Caprioli, Vincenzo: *See—*
Regiroli, Giovanni; Caprioli, Vincenzo; and Longoni, Angelo, 4,522,825, Cl. 514-517.000.

Carabo A.G.: *See—*
Holzbaur, Siegfried, 4,522,143, Cl. 114-344.000.

Cardiofrance Compagnie Francaise D'Electrocardiologie: *See—*
Buffet, Jacques, 4,522,208, Cl. 128-419.0PT.

Carey, Henry S., Jr., to Kerr-McGee Corporation. Non-plugging injection valve. 4,522,222, Cl. 137-240.000.

Carl Freudenberg, Firma: *See—*
Holzer, Helmut, 4,522,328, Cl. 277-47.000.
Holzer, Helmut, 4,522,410, Cl. 277-56.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Rossow, Eberhard, 4,523,094, Cl. 250-311.000.

Carlson, Curtis R.; Adelson, Edward H.; and Anderson, Charles H., to RCA Corporation. System for coring an image-representing signal. 4,523,230, Cl. 358-167.000.

Carlson, Heinz F. Burglar alarm system incorporating pneumatically operated components. 4,522,146, Cl. 116-2.000.

Carre, Jean-Jacques; and Courbot, Pierre, to Societe Anonyme D.B.A. Volumetric machine with conical screws. 4,522,576, Cl. 418-194.000.

Carro, Jose ; and de Velasco, Frank. Soluble assay. 4,522,922, Cl. 436-500.000.

Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., to Carter Wind Power. Wind-driven generator apparatus. 4,522,561, Cl. 416-11.000.

Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., to Carter Wind Power. Wind-driven generator apparatus. 4,522,564, Cl. 416-140.000.

Carter, J. Warne, Sr.: *See*—
Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., 4,522,561, Cl. 416-11.000.
Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., 4,522,564, Cl. 416-140.000.

Carter, James L.: *See*—
McVicker, Gary B.; Carter, James L.; Murrell, Lawrence L.; and Ziemiak, John J., 4,522,928, Cl. 502-26.000.

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Carter, J. Warne, Jr.; and Carter, J. Warne, Sr., 4,522,561, Cl. 416-11.000.
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Casazza, Anna M.: *See*—
Bargiotti, Alberto; Penco, Sergio; and Casazza, Anna M., 4,522,815, Cl. 514-34.000.

Casio Computer Co., Ltd.: *See*—
Ishii, Hiroshi, 4,522,100, Cl. 84-1.030.
Kameda, Osamu; and Fuse, Takahiro, 4,523,232, Cl. 358-236.000.

Cassella Aktiengesellschaft: *See*—
Schmitz, Hermann; and Kuhlein, Klaus, 4,522,997, Cl. 526-264.000.

Cassou, Bertrand, to Cassou, Bertrand; Cassou, Robert; and Cassou, Maurice. Artificial insemination apparatus. 4,522,621, Cl. 604-140.000.

Cassou, Maurice: *See*—
Cassou, Bertrand, 4,522,621, Cl. 604-140.000.

Cassou, Robert: *See*—
Cassou, Bertrand, 4,522,621, Cl. 604-140.000.

Casstevens, Arvil; Coble, William H.; Shields, Harper; Ferrell, Roscoe M.; and Jordan, Bobby R., to Kayser-Roth Hosiery, Inc. Yarn cutting and clamping apparatus for circular knitting machines. 4,522,042, Cl. 66-140.00S.

Castle, Gary. Tape wiper. 4,521,934, Cl. 15-236.00R.

Caterpillar Tractor Co.: *See*—
Kemper, Yves J., 4,522,079, Cl. 74-191.000.

Celanese Corporation: *See*—
Calundann, Gordon W.; Charbonneau, Larry F.; and Benicewicz, Brian C., 4,522,974, Cl. 524-605.000.
Hyde, Rebecca A.; Krimminger, Kenneth R.; and Swander, Robert E., 4,522,616, Cl. 493-44.000.
Menezes, Edgar V.; Southern, John H.; Ballman, Richard L.; and Chamberlin, J. M., 4,522,773, Cl. 264-167.000.

Celotex Corporation, The: *See*—
Frentzel, Richard L.; and Moss, Ernest K., 4,522,877, Cl. 428-304.400.

Cement Company Ltd.: *See*—
Kashima, Masao; and Tomuro, Noboru, 4,522,927, Cl. 501-139.000.

Central Glass Company, Limited: *See*—
Kawai, Toshikazu; Suzuki, Haruo; and Kaneda, Shouzou, 4,523,041, Cl. 568-755.000.

Centre National Du Machinisme Agricole, Du Genie Rural, Des Eaux et des Forets (Cemagref): *See*—
Gille, Etienne; Lucas, Jean; Mechineau, Didier; and Monod, Marie-Odile, 4,522,841, Cl. 427-4.000.

Cerundolo, Daniel G.: *See*—
Gelinas, Sandra L.; Cerundolo, Daniel G.; and Abele, John E., 4,522,212, Cl. 128-642.000.

Chabot, Carol; and Chabot, Ovila. Belt buckle. 4,521,939, Cl. 24-188.000.

Chabot, Ovila: *See*—
Chabot, Carol; and Chabot, Ovila, 4,521,939, Cl. 24-188.000.

Chaix, Jean E., to Commissariat a l'Energie Atomique. Steam generator. 4,522,156, Cl. 122-34.000.

Chakrabarti, Paritosh M.: *See*—
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,523,004, Cl. 528-76.000.

Chamberlin, J. M.: *See*—
Menezes, Edgar V.; Southern, John H.; Ballman, Richard L.; and Chamberlin, J. M., 4,522,773, Cl. 264-167.000.

Chambers, Derek: *See*—
Baker, Richard H.; Chu, David L.; and Chambers, Derek, 4,523,269, Cl. 363-138.000.

Champaigne, Jack M. Mass flow indicator for metal particles. 4,523,146, Cl. 324-204.000.

Champion Spark Plug Company: *See*—
Lenk, Michael; and Podiak, Richard S., 4,522,170, Cl. 123-198.0DC.

Chan, Joseph Y.: *See*—
Garbis, Dennis; Chan, Joseph Y.; Granata, Amedeo J.; and Heller, Robert C., 4,522,149, Cl. 118-725.000.

Chan, Mankin: *See*—
Yen, Teh F.; and Chan, Mankin, 4,522,265, Cl. 166-307.000.

Chan, Wan-kit: *See*—
Loev, Bernard; Jones, Howard; and Chan, Wan-kit, 4,523,042, Cl. 568-824.000.

Chang, Melvin C.; and Howell, John L., to United States Steel Corporation. Method of furnace operation with high pellet burdens. 4,522,649, Cl. 75-41.000.

Charbonneau, Larry F.: *See*—
Calundann, Gordon W.; Charbonneau, Larry F.; and Benicewicz, Brian C., 4,522,974, Cl. 524-605.000.

Charney, Gregory S.; and Hohner, Terrance D. Desk top. 4,522,364, Cl. 248-460.000.

Chartered Industries of Singapore Private Limited: *See*—
Sullivan, James L., 4,522,106, Cl. 89-140.000.

Chasar, Dwight W., to B. F. Goodrich Company, The. Polyphosphoramidite oligomers and stabilizer compositions thereof. 4,522,735, Cl. 252-49.900.

Chatterton, Robert T., Jr., to Northwestern University. Method of totally suppressing ovarian follicular development. 4,522,831, Cl. 514-169.000.

Cheeseboro, Robert G. Magnetically recordable label for mechanically-defined information-bearing discs. 4,523,305, Cl. 369-33.000.

Chen, Hsing-Yao, to RCA Corporation. Cathode-ray tube having asymmetric slots formed in a screen grid electrode of an inline electron gun. 4,523,123, Cl. 313-412.000.

Chen, Mary S.: *See*—
Wan, K. Ming; Chen, Mary S.; and Pendse, Anil D., 4,523,026, Cl. 560-163.000.

Chen, Nai Y.: *See*—
Yan, Tsoung Y.; and Chen, Nai Y., 4,522,703, Cl. 208-106.000.

Chen, Tyen C.; Busching, Forrest B.; Hale, William D.; and Kristoffersen, Bjorn R., to Boeing Company, The. Nonrecirculating vacuum flush toilet system utilizing fresh water. 4,521,925, Cl. 4-362.000.

Chen, Wen S.: *See*—
Mickelsen, Reid A.; and Chen, Wen S., 4,523,051, Cl. 136-260.000.

Chenesseau: *See*—
Agache, Georges, 4,522,173, Cl. 123-276.000.

Chester, Arthur W.; and Chu, Yung F., to Mobil Oil Corporation. Active zeolite catalysts of improved stability. 4,522,929, Cl. 502-77.000.

Chester, Arthur W.; Chou, Tai-Sheng; and Chu, Yung-Feng, to Mobil Oil Corporation. Process for syngas conversions to liquid hydrocarbon products utilizing ZSM-45 zeolite. 4,523,047, Cl. 585-322.000.

Chevron Research Company: *See*—
Chin, Thomas G.; and Alston, Arthur, 4,522,056, Cl. 73-64.200.
Current, Steven P., 4,523,029, Cl. 560-204.000.
Kurkov, Victor P., 4,522,745, Cl. 252-500.000.
Thompson, Robert E.; Gould, Gordon; and Soodak, Charles I., 4,522,464, Cl. 350-96.230.

Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, to Chisso Corporation. Polypropylene resin for high-rigidity molded products. 4,522,994, Cl. 526-351.000.

Chicago Rawhide Mfg. Co.: *See*—
Burgan, Thomas J., 4,522,411, Cl. 277-134.000.

Chicopee: *See*—
Mays, Alfred T., 4,522,203, Cl. 128-132.00D.

Chin, Danny; Batterman, Eric P.; and Bolger, Thomas V., to RCA Corporation. TV Receiver circuitry for performing chroma gain, auto-flesh control and the matrixing of I and Q signals to (R-Y), (B-Y) and (G-Y) signals. 4,523,221, Cl. 358-21.00R.

Chin, Roland L.; and Ferguson, Susan A., to Allied Corporation. Method of ion beam synthesis of thin silicon nitride films and resulting articles. 4,522,886, Cl. 428-446.000.

Chin, Thomas G.; and Alston, Arthur, to Chevron Research Company. Method and apparatus for measuring Reid Vapor Pressure. 4,522,056, Cl. 73-64.200.

Chinn, Martin D.: *See*—
Kistler, Walter P.; and Chinn, Martin D., 4,522,066, Cl. 73-781.000.

Chisso Corporation: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,522,994, Cl. 526-351.000.
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,522,741, Cl. 252-299.630.

Chisvette, Dominick; Lattimore, James; and Sova, Stanley G., to Inmont Corporation. Continuous method of producing phthalocyanine pigment dispersions in organic solvent. 4,522,654, Cl. 106-288.00Q.

Chivens, Donald R.; Greskovics, Paul; and Kelm, Edward C., to Autarkic Flow Controls. Timed flow control valve assembly. 4,522,221, Cl. 137-118.000.

Chou, Tai-Sheng: *See*—
Chester, Arthur W.; Chou, Tai-Sheng; and Chu, Yung-Feng, 4,523,047, Cl. 585-322.000.

Chow, Kuen: *See*—
Brown, Roger H.; Chow, Kuen; Goodwin, Norman W.; and Grinberg, Jan, 4,523,067, Cl. 219-10.49R.

Christiansen, Dieter; and Redies, Bernd. Centrally controlled lighting installation having a plurality of individually switched light points central switch elements and individual light switches therefor. 4,523,132, Cl. 315-321.000.

Chu, David L.: *See*—
Baker, Richard H.; Chu, David L.; and Chambers, Derek, 4,523,269, Cl. 363-138.000.

Chu, Mosi; and Kuo, Meng S., to Primages, Inc. Sheet and envelope feed apparatus for a printer and associated methods. 4,522,382, Cl. 270-1.100.

Chu, Pochen; and Pasquale, Gary M., to Mobil Oil Corporation. Octane enhancement and total liquid product yield improvements in catalytic

cracking using in-situ crystallized ZSM-5 clay aggregates. 4,522,705, Cl. 208-120.000.

Chu, Yung F.: *See—*
Chester, Arthur W.; and Chu, Yung F., 4,522,929, Cl. 502-77.000.

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Chester, Arthur W.; Chou, Tai-Sheng; and Chu, Yung-Feng, 4,523,047, Cl. 585-322.000.

Chung, James Y. J.; and Rosthauser, James W., to Mobay Chemical Corporation. Molding compositions having an enhanced resistance to gasoline. 4,522,979, Cl. 525-66.000.

Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., to Boeing Company, The. Door anti-hijacking latch/lock mechanism with pneumatic decompression override. 4,522,359, Cl. 244-129.500.

Ciba Geigy AG: *See—*
Ikin, John B., 4,522,497, Cl. 356-431.000.

Ciba-Geigy Corporation: *See—*
Haas, Georges; von Sprecher, Andreas; and Ferrini, Pier G., 4,523,030, Cl. 562-460.000.
Hilti, Bruno; Mayer, Carl W.; and Rihs, Grety, 4,522,754, Cl. 260-239.00R.

Cibie Projecteurs: *See—*
Baciu, Antoine; Rius, Jean M.; and Sivry, Bernard, 4,522,778, Cl. 264-328.700.

Ciriscioli, Peter R.: *See—*
Fell, Barry M.; and Ciriscioli, Peter R., 4,522,673, Cl. 156-307.300.

Claassen, Pamela L.; and Booz, A. David, to Aluminum Company of America. Metal pigment of improved storage resistance. 4,522,655, Cl. 106-290.000.

Clapp, Roger E., to United States of America, Air Force. Radio frequency lens antenna. 4,523,198, Cl. 343-754.000.

Clapper, Robert L.; Gradle, Richard J.; and Bake, Earl A., to Rockwell International Corporation. Orifice plate seal ring for controlled closure check valve. 4,522,230, Cl. 137-496.000.

Clare, Hugh J.: *See—*
Shah, Ramesh C. R.; Clare, Hugh J.; and Berry, Ronald F., 4,522,544, Cl. 414-330.000.

Clarion Co., Ltd.: *See—*
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,523,241, Cl. 360-105.000.

Clark Equipment Company: *See—*
Shelbourn, William C.; Kuhn, Patrick; and Vig, Michael A., 4,522,373, Cl. 251-297.000.

Clark, Gary A.; Johnson, Frederick W.; and Queener, Carl A., to International Business Machines Corporation. Method and apparatus for adaptive collation. 4,522,486, Cl. 355-14.0SH.

Clark, George W.; and Keene, Christopher B., to 434743 Ontario Inc. Rigid polyethylene carry golf bag with stand. 4,522,299, Cl. 206-315.300.

Clarke, Peter J.: *See—*
Dimock, Jack A.; and Clarke, Peter J., 4,522,697, Cl. 204-298.000.

Classic Corp.: *See—*
Keefer, Donald W., 4,521,929, Cl. 5-422.000.

Claude, Timothy J.: *See—*
Timm, Gerald W.; Sandford, Donald L.; Claude, Timothy J.; and Helms, Richard A., 4,522,198, Cl. 128-79.000.

Clawges, Charles A. Golf putter. 4,522,405, Cl. 273-167.00A.

Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Process for separating fatty acids from rosin acids. 4,522,761, Cl. 260-419.000.

Clecak, Nicholas J.; McKean, Dennis R.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., to International Business Machines Corporation. Deep ultra-violet lithographic resists with diazohomotetramic acid compounds. 4,522,911, Cl. 430-192.000.

Clecim: *See—*
Doudet, Michel, 4,522,052, Cl. 72-265.000.

Cleland, Keith B. Ore separator apparatus. 4,522,711, Cl. 209-298.000.

Clerk, Ernest J. Hand-held fishing reel. 4,522,349, Cl. 242-96.000.

Clineschmidt, Bradley V.: *See—*
Remy, David C.; and Clineschmidt, Bradley V., 4,522,821, Cl. 514-320.000.

Closson, James M.; and Hay, Noah D., to General Electric Company. Method of making a ducted dry type transformer. 4,521,955, Cl. 29-605.000.

Clowes, Ernest J., to Aluminum Company of America. Aluminum alloy food can body and method for making same. 4,522,049, Cl. 72-46.000.

Coble, William H.: *See—*
Casstevens, Arvil; Coble, William H.; Shields, Harper; Ferrell, Roscoe M.; and Jordan, Bobby R., 4,522,042, Cl. 66-140.00S.

Coburn Optical Industries: *See—*
Tusinski, Joseph, 4,521,994, Cl. 51-58.000.

Coca-Cola Company, The: *See—*
Paisley, Gary V.; and Malaspina, Alex, 4,522,856, Cl. 428-64.000.
Richter, Simon J., 4,522,319, Cl. 222-481.500.

Coe, Anthony D.: *See—*
Williams, Frederick; and Coe, Anthony D., 4,522,554, Cl. 414-686.000.

Coenen, Hubert: *See—*
Kriegel, Ernst; and Coenen, Hubert, 4,522,707, Cl. 208-180.000.

Cohen, Abraham B.: *See—*
Heiart, Robert B.; and Cohen, Abraham B., 4,522,903, Cl. 430-22.000.

Coinaqua Limited: *See—*
Malcolm, John I., 4,522,389, Cl. 272-4.000.

Colcher, David: *See—*
Schlom, Jeffery; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,522,918, Cl. 435-68.000.

Coleman Company, Inc., The: *See—*
Curtis, Richard D., 4,522,582, Cl. 431-123.000.
Knowles, Joe E.; and Winters, Mellie E., 4,522,191, Cl. 126-307.00R.

Colgate-Palmolive Company: *See—*
Gray, Frederick W., 4,522,739, Cl. 252-95.000.

Columbia Industries, Inc.: *See—*
Miller, Charles M., Jr.; and Orlando, Samuel J., 4,522,397, Cl. 273-63.00D.

Combustion Engineering, Inc.: *See—*
Felice, Frank T., 4,522,926, Cl. 501-127.000.

Commandeur, Raymond; and Gurtner, Bernard, to Atochem. Compositions of polyarylalkane oligomers and process for their manufacture. 4,523,044, Cl. 585-11.000.

Commissariat a l'Energie Atomique: *See—*
Chaix, Jean E., 4,522,156, Cl. 122-34.000.

Commonwealth of Australia, The: *See—*
Patrick, James F.; Crosby, Peter A.; Kuzma, Janusz A.; and Money, David K., 4,522,209, Cl. 128-419.00R.

Communications Technology Corporation: *See—*
Dagan, Gideon B.; and Waas, Charles W., 4,523,061, Cl. 200-17.00R.

Compagnie de Signaux et D'Entreprises Electriques: *See—*
Deprez, Louis, 4,523,265, Cl. 363-21.000.

Compagnie Generale de Geophysique: *See—*
Cretin, Jacques; and Beauducel, Claude, 4,523,191, Cl. 340-825.520.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See—*
Ugon, Michel; and Nonat, Jean-Pierre, 4,523,297, Cl. 364-900.000.

Computer Peripherals Inc.: *See—*
Messenger, Carl, 4,523,133, Cl. 318-7.000.

Comtech Research: *See—*
Pettigrew, Robert M.; Bradbrook, John D.; Smith, Alan M.; and Fisher, John H., 4,522,482, Cl. 355-3.00R.

Congdon, James S., to GenRad, Inc. Enhanced-accuracy semiconductor power amplifier. 4,523,154, Cl. 330-266.000.

Conley, Edwin E. Pre-stressed fiber-resin sucker rod and method of making same. 4,522,529, Cl. 403-343.000.

Conley, William R.: *See—*
Volkers, Jack C.; and Conley, William R., 4,522,890, Cl. 428-624.000.

Connolly, John C.; and Botez, Dan, to RCA Corporation. Semiconductor laser having high manufacturing yield. 4,523,318, Cl. 372-48.000.

Connolly, John D., Jr.; Gallivan, Timothy J.; and Ringle, Richard P., to General Electric Company. Method for the manufacture of nuclear fuel products. 4,522,769, Cl. 264-0.500.

Consiglio Nazionale Delle Ricerche: *See—*
D'Angelo, Silvano; Modena, Ivo; and Romani, Gian L., 4,523,147, Cl. 324-248.000.

Container Graphics Corporation: *See—*
Saunders, Philip G.; and Simpson, Jack R., 4,522,095, Cl. 83-116.000.

Container Products Corp.: *See—*
Johnston, Charles R.; and Green, Gregory M., 4,521,935, Cl. 15-322.000.

Continental Group, Inc., The: *See—*
Andersen, Jorn W., 4,522,770, Cl. 264-36.000.

Control Data Corporation: *See—*
Keel, Beat G.; and Johnson, Robert W., 4,523,238, Cl. 360-46.000.

Cook, Koy B.: *See—*
Sulouff, Robert E.; Hartin, Sam S.; Cook, Koy B.; Kerns, David V., Jr.; Davidson, Jimmy L.; and Warren, Keith O., 4,522,072, Cl. 73-765.000.

Cooper LaserSonics, Inc.: *See—*
Gallant, Ben J., 4,522,597, Cl. 433-216.000.

Corey, John A., to Mechanical Technology Incorporated. Multi-cylinder hot gas engine. 4,522,030, Cl. 60-525.000.

Corfield, Brian L.; and Rowe, Raymond C., to Imperial Chemical Industries PLC. Manufacture of highlighted intagliated articles. 4,522,840, Cl. 427-3.000.

Cornell Dubilier Electronics: *See—*
Pitel, Ira J., 4,523,129, Cl. 315-291.000.

Cornell Dubilier Electronics Inc.: *See—*
Pitel, Ira J., 4,523,130, Cl. 315-291.000.

Cornet, Julien; and Van Laethem, Robert, to Glaverbel. Coating vitreous substrates. 4,522,847, Cl. 427-55.000.

Cornils, Boy; Hibbel, Josef; Lieder, Bernhard; Much, Joachim; Schmidt, Volkmar; Wiebus, Ernst; and Konkol, Werner, to Ruhrchemie Aktiengesellschaft. Process for the preparation of aldehydes. 4,523,036, Cl. 568-454.000.

Corning Glass Works: *See—*
Tennent, David L.; and Sharma, Bhavender P., 4,522,924, Cl. 501-2.000.

Cornwall, Harry J.; and Hanebrink, Daniel E. Two wheel trailer. 4,522,425, Cl. 280-656.000.

Corporation of the Town of Vaughan, The: *See—*
Campbell, R. Clark; and Townsend, D. Ronald, 4,522,533, Cl. 405-36.000.

Costa, Robert B., to RIS Irrigation Systems. Irrigation fitting with installation barb and associated barb installation tool. 4,522,339, Cl. 239-272.000.

Courbin, Gerard: *See—*
Martin, Madeleine; Lesage, Jean; Courbin, Gerard; and Rivereau, Alain, 4,522,878, Cl. 428-313.700.

Courbot, Pierre: *See*—
Carre, Jean-Jacques; and Courbot, Pierre, 4,522,576, Cl. 418-194.000.
Coyne, Alberta P.: *See*—
Coyne, Daniel P.; and Coyne, Alberta P., 4,522,598, Cl. 434-259.000.
Coyne, Daniel P.; and Coyne, Alberta P. Educational toy mailbox. 4,522,598, Cl. 434-259.000.
Craft, Jack: *See*—
Jose, David L.; Pike, Winthrop S.; and Craft, Jack, 4,523,105, Cl. 307-261.000.
Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,522,943, Cl. 514-183.000.
Crespy, Serge. Lighter combined with instrument. 4,522,584, Cl. 431-253.000.
Cretin, Jacques; and Beauducel, Claude, to Institut Francais du Petrole; and Compagnie Generale de Geophysique. Device for interconnecting a series of data acquisition apparatuses to a remote receiving and recording system. 4,523,191, Cl. 340-825.520.
Cristiano, Gary M.: *See*—
Walczak, Thomas J.; Stone, Richard M.; and Cristiano, Gary M., 4,523,155, Cl. 330-279.000.
Croft, Leon: *See*—
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.
Crosby, Peter A.: *See*—
Patrick, James F.; Crosby, Peter A.; Kuzma, Janusz A.; and Money, David K., 4,522,209, Cl. 128-419.00R.
Croset, Michel; and Mercandalli, Louis, to Thomson-CSF. Method of reduction of a compound forming a layer on a substrate and the application of said method to the fabrication of a field-effect semiconducting structure. 4,521,951, Cl. 29-571.000.
Cullinan, George J.: *See*—
Ades, Edwin W.; and Cullinan, George J., 4,522,750, Cl. 260-112.00R.
Culp, Charles H., to Honeywell Inc. Adaptive optimum start/stop control system. 4,522,336, Cl. 236-46.00R.
Cuneo, Giuseppe, to Black & Decker Inc. Switching device for reversing a portable electric tool. 4,523,115, Cl. 310-50.000.
Cunningham, Eldon R., to General Electric Company. Method of providing a lubrication system. 4,523,118, Cl. 310-90.000.
Cunningham, Frank W.; and Weir, David. Reusable, sterile covering for a surgical camera. 4,522,196, Cl. 128-4.000.
Current, Steven P., to Chevron Research Company. Oxidative carbonylation of alcohols to produce dialkyl oxalates. 4,523,029, Cl. 560-204.000.
Curtis, Richard D., to Coleman Company, Inc., The. Fuel control system for burners. 4,522,582, Cl. 431-123.000.
Cuscurida, Michael; and Klein, Howard P., to Texaco Inc. Polymer polyols from partially reacted polyamines. 4,523,025, Cl. 560-26.000.
CVI Incorporated: *See*—
Jensen, Jack E., 4,522,033, Cl. 62-6.000.
Dacomed Corporation: *See*—
Timm, Gerald W.; Sandford, Donald L.; Claude, Timothy J.; and Helms, Richard A., 4,522,198, Cl. 128-79.000.
Dagan, Gideon B.; and Waas, Charles W., to Communications Technology Corporation. Switching assembly for telephone cables. 4,523,061, Cl. 200-17.00R.
Daicel Chemical Industries, Ltd.: *See*—
Kanno, Tatsuya; and Toga, Yuzo, 4,522,913, Cl. 430-285.000.
Watanabe, Shoji; and Okitsu, Kiyoshi, 4,522,984, Cl. 525-415.000.
Daimler-Benz Aktiengesellschaft: *See*—
Dudeck, Ingo; Hipp, Ulrich; Maass, Manfred; and Ruoff, Harald, 4,523,136, Cl. 318-568.000.
Frankle, Gerhard; and Joppig, Peter, 4,522,164, Cl. 123-180.00R.
Struck, Helmut; Richter, Karl H.; Klein, Michael; Ruth, Ulrich; and Ulke, Walter, 4,522,418, Cl. 280-95.00A.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Matsumoto, Katsutoshi, 4,522,123, Cl. 101-349.000.
D'Alterio, Joseph C. Paired conveyor belts with zigzag travel. 4,522,217, Cl. 134-75.000.
Dana Corporation: *See*—
Joyner, Robert G., 4,522,608, Cl. 464-134.000.
D'Angelo, Silvano; Modena, Ivo; and Romani, Gian L., to Consiglio Nazionale Delle Ricerche. Fine balancing second derivative gradiometer. 4,523,147, Cl. 324-248.000.
Daniels, Nicholas R., to Emerson Electric Co. Dynamoelectric machine with self-sealing lead wire grommet. 4,523,117, Cl. 310-71.000.
d'Anjou, Daniel: *See*—
Peterson, Gudmundur P.; and d'Anjou, Daniel, 4,522,026, Cl. 60-39.281.
Dantzig, Jonathan A.; and Patton, John V., to Olin Corporation. Flux concentrator. 4,522,790, Cl. 422-246.000.
Das, Jagabandhu; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted prostaglandin interphenylene analogs useful as cardiovascular agents. 4,522,949, Cl. 514-469.000.
Das, Suryya K.; Boberski, William G.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., to PPG Industries, Inc. High-solids coating composition for improved rheology control containing chemically modified inorganic microparticles. 4,522,958, Cl. 523-212.000.
Datakey, Inc.: *See*—
Wehrmacher, William H., 4,522,456, Cl. 339-17.00R.
Daud, Taher: *See*—
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David Brown Tractors Ltd.: *See*—
Williams, Frederick; and Coe, Anthony D., 4,522,554, Cl. 414-686.000.
Davidson, Jimmy L.: *See*—
Sulouff, Robert E.; Hartin, Sam S.; Cook, Koy B.; Kerns, David V., Jr.; Davidson, Jimmy L.; and Warren, Keith O., 4,522,072, Cl. 73-765.000.
Davis, Phillip N. Lock and door reinforcing plate means. 4,522,048, Cl. 70-417.000.
Davis, Richard A.: *See*—
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Davis, Russell R.: *See*—
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.
Davis, Wilfrid E.; and Davis, Richard A. Wall panels. 4,522,002, Cl. 52-309.100.
Dayco Corporation: *See*—
Anderson, John F., Jr.; and Long, Delmar D., 4,522,869, Cl. 428-245.000.
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Grunwald, Werner; Pfizenmaier, Heinz; de la Prieta, Claudio; Schmid, Kurt; and Schmidt, Ewald, 4,522,671, Cl. 156-235.000.
Dean, Robert R.: *See*—
Oswald, Norman D.; Dean, Robert R.; and Mankey, Harry S., 4,522,548, Cl. 414-458.000.
Dean, Walter C., II, to Budd Company, The. Shock mount apparatus. 4,522,304, Cl. 206-591.000.
DeAnda, Nicholas: *See*—
Kilroy, Eugene J.; Morse, James E.; Grimm, Thomas H.; and DeAnda, Nicholas, 4,522,607, Cl. 446-447.000.
DeBergalis, Michael, to Du Pont de Nemours, E. I., and Company. Polymers containing resorcinol monobenzoate. 4,522,971, Cl. 524-547.000.
Dechow, Fred J.; Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., to Mitco Water Laboratories, Inc. Upflow ion exchange treatment of natural edible juices containing high acidity and suspended solids. 4,522,836, Cl. 426-271.000.
Deere & Company: *See*—
Nelson, Leon F.; Montgomery, Dan T.; Wyffels, Michael K.; and Sikula, William J., Jr., 4,522,553, Cl. 414-526.000.
Wohlford, William P., 4,522,452, Cl. 305-43.000.
Degen, Max, to Schweizerische Eidgenossenschaft vertreten durch die Gruppe fur Rustungsdienste. Apparatus for an aircraft for dropping objects, especially bombs. 4,522,104, Cl. 89-1.510.
Degner, Frederick M., to Budd Company, The. Method and apparatus for processing slag. 4,522,377, Cl. 266-196.000.
Degussa Aktiengesellschaft: *See*—
Effenberger, Franz; and Beisswenger, Thomas, 4,523,012, Cl. 544-316.000.
Deininger, Horst, to Linde Aktiengesellschaft. Adjustable axial piston pumps with reglating units and regulating units for the same. 4,522,566, Cl. 417-222.000.
Del Bon, Luigi. Discharge valve for use in a pressurized container. 4,522,318, Cl. 222-402.240.
Delevallee , Francoise; and Deraedt, Roger, to Roussel Uclaf. Analgesic treatment and compositions. 4,522,816, Cl. 514-52.000.
Delonge, Jean-Claude L.: *See*—
Bouiller, Jean G.; and Delonge, Jean-Claude L., 4,522,557, Cl. 415-115.000.
DeLorme, David M. Universal hub for geodesic type structures. 4,521,998, Cl. 52-81.000.
Deltakabel B.V.: *See*—
De Roo, Minno, 4,523,190, Cl. 340-825.030.
Dennison National Company: *See*—
Lozfau, Arthur; and Lucey, William H., 4,522,526, Cl. 402-37.000.
DeNovellis, Michelangelo: *See*—
Marlettini, Maria G.; DeNovellis, Michelangelo; Labriola, Ernesto; Salomone, Teresa; and Tomassetti, Paola, 4,522,827, Cl. 514-671.000.
Densmore, Richard M.: *See*—
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Denzin, Horst; and Pach, Horst, to Francotyp Gesellschaft mbH. Chassis for a franking or postage metering machine. 4,522,121, Cl. 101-92.000.
Deprez, Louis, to Compagnie de Signaux et D'Entreprises Electriques. Process and device for eliminating the disturbances related to the fluctuations of the load in chopped power supplies. 4,523,265, Cl. 363-21.000.
Deraedt, Roger: *See*—
Delevallee , Francoise; and Deraedt, Roger, 4,522,816, Cl. 514-52.000.
De Roo, Minno, to Deltakabel B.V. Local exchange equipment for a cable network. 4,523,190, Cl. 340-825.030.
D'Errico, Michael J., to Sherwin-Williams Company, The. Dialkylaminomethyl aromatic triazoles as corrosion inhibitors. 4,522,785, Cl. 422-12.000.
Desarnaud, Jean: *See*—
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Deschenes, Charles: *See—*
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DeSoto, Inc.: *See—*
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Desson, Carmen F. Big blotter towel. 4,522,858, Cl. 428-96.000.
Detonics Pistol Accessories Ltd.: *See—*
Woodcock, Sidney H.; Maes, Michel E.; and Steimel, Ronald W., 4,522,107, Cl. 89-196.000.
Deutsch, Alice; and Platt, Herbert, to Genetic Diagnostics Corporation. Self-contained assay method and kit. 4,522,923, Cl. 436-536.000.
Deutsche Automobilgesellschaft mit beschrankter Haftung: *See—*
Klink, Rainer, 4,522,290, Cl. 192-107.00M.
Deutsche Gesellschaft: *See—*
Leister, Peter, 4,522,620, Cl. 494-10.000.
DeVaney, David B.: *See—*
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.
de Velasco, Frank: *See—*
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Devins, John C.; and Sharbaugh, Amandus H., to General Electric Company. Remote pressure sensor. 4,522,065, Cl. 73-705.000.
De Volder, Noel J.: *See—*
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DeWald, Jack J. Unitized well testing apparatus for use in hostile environments. 4,522,258, Cl. 166-57.000.
de Winter, Walter F.; Uytterhoeven, Herman J.; Gilliams, Yvan K.; and De Volder, Noel J., to AGFA-Gevaert N.V. Liquid electrophoretic developer. 4,522,908, Cl. 430-114.000.
Dhabhar, Dadi J.; and Schmidt, Nicholas F., to Richardson-Vicks Inc. Poly(ethylene oxide)/polyethylene glycol-containing hydrophilic denture adhesive. 4,522,956, Cl. 523-120.000.
Dibbern, John E., Jr.; and Moores, Gregory E., to Black & Decker, Inc. Electrical connection system for motors. 4,523,116, Cl. 310-71.000.
Dickakian, Ghazi B., to Du Pont de Nemours, E. I., and Company. Process for preparing an anisotropic aromatic pitch. 4,522,701, Cl. 208-40.000.
Dickey-john Corporation: *See—*
Bachman, Wesley J., 4,523,280, Cl. 364-424.000.
Didier-Werke A.G.: *See—*
Langenfeld, Wilhelm, 4,522,376, Cl. 266-47.000.
Diels, Wolfgang: *See—*
Bierbrauer, Heiner; and Diels, Wolfgang, 4,522,246, Cl. 160-223.000.
Diesel Kiki Co., Ltd.: *See—*
Nomura, Hiroshi, 4,522,112, Cl. 92-71.000.
Shibuya, Tsunenori, 4,522,573, Cl. 418-23.000.
Di Gregorio, Vincenzo. Subdivided block components reassemblable into three dimensional figures. 4,522,404, Cl. 273-157.00R.
Dimock, Jack A.; and Clarke, Peter J., to Sputtered Films, Inc. Wafer processing machine. 4,522,697, Cl. 204-298.000.
Dinger, Hans; Holzhauer, Hilbert; and Lang, Erberhard, to MTU. Method and apparatus for the displacement of two thrust reversers of jet engines of an aircraft in synchronism during the thrust reversal phase. 4,522,358, Cl. 244-110.00B.
Dion, Eric P., to Mobil Oil Corporation. Method for identifying select non-magnetic minerals in the presence of magnetic minerals. 4,523,149, Cl. 324-377.000.
DiRico, Mark A. Carton support and erection machine. 4,522,016, Cl. 53-564.000.
Disco Co., Ltd.: *See—*
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Ditter, Walter: *See—*
Horn, Dieter; Schmidt, Hans W.; Ditter, Walter; Hartmann, Horst; Lueddecke, Erik; and Schmieder, Klaus, 4,522,743, Cl. 252-311.000.
Diver, James J.: *See—*
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Dobrovolny, Pierre, to Zenith Electronics Corporation. Microwave oscillator and single balanced mixer for satellite television receiver. 4,523,159, Cl. 331-99.000.
Doi, Makoto: *See—*
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Donaldson Company, Inc.: *See—*
Fischer, Paul M.; and Schwarz, Carl E., 4,522,712, Cl. 210-86.000.
Donnelly, Edward N.; Haberkorn, Wilhelm A.; Hagen, Gerry A.; McGregor, Thomas R.; and Postman, William, to Badische Corporation. Integrated process for the production of textured polycaprolactam multifilament yarn. 4,522,774, Cl. 264-168.000.
Donohue, James M.; Markle, Robert E.; and Mager, George E., to Xerox Corporation. Message transmitting system for reproduction machines and copiers. 4,523,299, Cl. 364-900.000.
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada. Carboxamido-derivatives of 5H-1,3,4-thiadiazolo[3,2-a]pyrimidines, compositions and use. 4,522,944, Cl. 514-222.000.
Dornier System GmbH: *See—*
Gieraths, Wolfgang, 4,523,196, Cl. 343-17.700.
Dorosz, Adolph S. Pallet nibbler method. 4,522,092, Cl. 83-40.000.
Dorow, Rainer; Horowski, Reinhard; Kehr, Wolfgang; and Wachtel, Helmut, to Schering Aktiengesellschaft. Trans-dihydrolisuride antipsychotic. 4,522,820, Cl. 424-288.000.
Dorsett, Danny R.; and Smith, Gerald D., Jr. Bolt-light bulb combination. 4,523,259, Cl. 362-120.000.
Doscher, Frank: *See—*
Klein, Joachim; Widdecke, Hartmut; Doscher, Frank; and Pohl, Fritz, 4,522,952, Cl. 521-31.000.
Doucette, Adrian R.: *See—*
Lindig, Charles E.; Brandstetter, Robert W.; and Doucette, Adrian R., 4,522,466, Cl. 350-162.120.
Doudet, Michel, to Clecim. Processes and devices for the drawing of tubes by extrusion. 4,522,052, Cl. 72-265.000.
Douthit, C. Staton; and Kirby, Edward R., to Associated Truss Company. Heavy load conveyor system. 4,522,547, Cl. 414-391.000.
Dow Chemical Company, The: *See—*
Arndt, Kim E.; Rogers, Richard B.; and McCormick, Ronald W., 4,522,642, Cl. 71-11.000.
Johnston, Howard; and Troxell, Lillian H., 4,523,017, Cl. 546-302.000.
Lee, John M.; and Bauman, William C., 4,522,951, Cl. 521-28.000.
Zieke, Larry M., 4,522,678, Cl. 156-501.000.
Dowa Co., Ltd.: *See—*
Miyahara, Kingo, 4,522,834, Cl. 426-231.000.
Doyle, Keith H. Water ski bindings. 4,522,603, Cl. 441-70.000.
Dragerwerk Aktiengesellschaft: *See—*
Wallroth, Carl F.; and Bauerle, Rainer, 4,522,213, Cl. 128-716.000.
Dreher, Adolf E. S., to Washex Machinery Corporation. Continuous batch laundry system. 4,522,046, Cl. 68-27.000.
Dresser Industries, Inc.: *See—*
Lunghofer, Eugene P., 4,522,731, Cl. 252-8.55R.
Driggers, John M., to Westinghouse Electric Corp. Small diameter radiant tube heater. 4,523,177, Cl. 338-303.000.
Dril-Quip, Inc.: *See—*
Reimert, Larry E., 4,522,431, Cl. 285-27.000.
Drothen, Michael; and Ressel, Willi, to Wickmann Werke GmbH. High voltage quick-break fuse. 4,523,172, Cl. 337-164.000.
DuBois, R. Clark. Apparatus and process for drop-feeding sheets to a typing or printing machine including separable paper clamping trays. 4,522,519, Cl. 400-624.000.
Ducombs, Marcel: *See—*
Messe , Gerard; Faure, Michel; and Ducombs, Marcel, 4,522,094, Cl. 83-92.000.
Dudeck, Ingo; Hipp, Ulrich; Maass, Manfred; and Ruoff, Harald, to Daimler-Benz Aktiengesellschaft. Safety arrangement for an adjustment installation of a seat adjustable manually or programmed. 4,523,136, Cl. 318-568.000.
Dumas, David H., to Hercules Incorporated. Aqueous sizing compositions. 4,522,686, Cl. 162-158.000.
Duncan, Freda. Star display. 4,523,260, Cl. 362-121.000.
Duncan, Robert: *See—*
Kerrey, John S.; and Duncan, Robert, 4,522,330, Cl. 228-182.000.
Dunn, James M., to Verex Laboratories, Inc. Constant release rate solid oral dosage formulations of propranolol. 4,522,804, Cl. 424-19.000.
Dunn, John R., to Polysar Limited. Bonded elastomeric hose assembly. 4,522,852, Cl. 428-36.000.
Dunn, Michael R.: *See—*
Lind, Michael A.; and Dunn, Michael R., 4,521,963, Cl. 30-92.000.
Dunn, Richard A. Center of gravity block removal, appraisal and balancing game. 4,522,393, Cl. 273-1.0GF.
Dunstan, Ericson M.; Gervais, William J.; and McClelland, S. Barry, to Micropolis. High precision floppy disc memory system. 4,523,240, Cl. 360-99.000.
Dunsworth, Charles L., to Metalines, Inc. Phosphorescent tread plate and composition. 4,522,861, Cl. 428-192.000.
Du Pont de Nemours, E. I., and Company: *See—*
Anderson, Arthur W.; Fritschel Scott J.; and Holmquist, Howard E., 4,522,995, Cl. 526-243.000.
Andrews, Gerald D., 4,522,990, Cl. 526-180.000.
DeBergalis, Michael, 4,522,971, Cl. 524-547.000.
Dickakian, Ghazi B., 4,522,701, Cl. 208-40.000.
Ebersole, Richard C., 4,522,786, Cl. 422-56.000.
Heiart, Robert B.; and Cohen, Abraham B., 4,522,903, Cl. 430-22.000.
Krueger, Achim R., 4,522,879, Cl. 428-323.000.
Lee, Duk H.; Feierberg, Susan; and O'Brien, Robert E., 4,522,742, Cl. 252-301.160.
Levitt, George, 4,522,645, Cl. 71-93.000.
Dusel, Robert O.; and Blaha, Gerald E., to Artos Engineering Company. Cutter and belt type conveyor for wire segments. 4,521,946, Cl. 29-33.00M.
Dvorak, Robert V., to Fairchild Camera and Instrument Corporation. Digital logic level comparator particularly for digital test systems. 4,523,143, Cl. 324-133.000.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, to Feldmuhle Aktiengesellschaft. Pre-combustion or turbulence chamber for internal combustion engines. 4,522,171, Cl. 123-270.000.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, to Feldmuhle Aktiengesellschaft. Piston ring for an internal combustion engine. 4,522,415, Cl. 277-216.000.
Dyer, David; and Wise, James L., to TechMark Corporation. Method and apparatus for recovering waste energy. 4,522,035, Cl. 62-79.000.
Dyer, Henry B. Abrasive bodies. 4,522,633, Cl. 51-307.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Neuschaffer, Karl-Heinz; Engels, Hans-Werner; Gebert, Hans-Jurgen; Laube, Robert W.; and Zoche, Gunter, 4,522,652, Cl. 106-84.000.
Dyneer Corporation: *See—*
Frazer, Benjamin F., 4,522,612, Cl. 474-168.000.
Dyonics, Inc.: *See—*
Whipple, Terry L.; and Sjostrom, Douglas D., 4,522,206, Cl. 128-312.000.
Dyson Refractories Limited: *See—*
Sambrook, Rodney M.; and Ross, Julian R. H., 4,522,940, Cl. 502-328.000.
Dzus Fastener Co., Inc.: *See—*
Bidwell, Richard H., 4,522,541, Cl. 411-554.000.
E.N.I. Ente Nazionale Idrocarburi: *See—*
Sisto, Alessandro; Verdini, Antonio S.; and Virdia, Antonino, 4,522,752, Cl. 260-112.50R.
E. R. Squibb & Sons, Inc.: *See—*
Das, Jagabandhu; and Haslanger, Martin F., 4,522,949, Cl. 514-469.000.
Eastman Kodak Company: *See—*
Minor, James C., 4,522,542, Cl. 412-25.000.
Stockbridge, Bruce W., 4,521,944, Cl. 28-264.000.
Eaton Corporation: *See—*
Goscenski, Edward J., Jr., 4,522,609, Cl. 474-62.000.
Kroll, John W.; and Hyink, Roy, 4,522,147, Cl. 116-216.000.
Mahon, Joseph J., 4,523,062, Cl. 200-35.00R.
Ebersole, Richard C., to Du Pont de Nemours, E. I., and Company. Multilayered test device for detecting analytes in liquid test samples. 4,522,786, Cl. 422-56.000.
Ebneth, Harold; Wolf, Gerhard D.; and Giesecke, Henning, to Bayer Aktiengesellschaft. Lightning protection composite material. 4,522,889, Cl. 428-614.000.
Eckenhoff, James B.: *See—*
Peery, John R.; and Eckenhoff, James B., 4,522,622, Cl. 604-191.000.
Ecopool Design Limited: *See—*
Bastenhof, Dirk, 4,522,535, Cl. 405-79.000.
Edgren, David, to Alza Corporation. Drug dispenser comprising wall formed of semipermeable member and enteric member. 4,522,625, Cl. 604-892.000.
Edwards, Merle L.; Meyer, Wayne A.; and Shook, James M., to Bolens Corporation. Grass catching receptacle. 4,522,019, Cl. 56-202.000.
Effenberger, Franz; and Beisswenger, Thomas, to Degussa Aktiengesellschaft. S-substituted 2-azido-3-mercapto-propionic acid ester and process for its production and use. 4,523,012, Cl. 544-316.000.
Eggeling, Ernst: *See—*
Munschenborn, Dieter; and Rautenbach, Robert, 4,522,342, Cl. 241-57.000.
Ehlers, Raymond C.: *See—*
Bauers, Barton M.; Raudat, John L.; Ehlers, Raymond C.; and Thompson, Timothy H., 4,522,011, Cl. 53-55.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Electrical conductors arranged in multiple layers. 4,522,888, Cl. 428-546.000.
Eilentropp, Heinz, to HEW Kabel, Heinz Eilentropp KG. Flexible electrical thermal element. 4,523,086, Cl. 219-549.000.
Eisai Co., Ltd.: *See—*
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Kajiwara, Akiharu; and Ota, Kiichiro, 4,522,759, Cl. 260-404.000.
Elastomer Seals, Inc.: *See—*
Nicholas, John D., 4,522,413, Cl. 277-205.000.
Electro-Flow Controls, Inc.: *See—*
Smith, George E., 4,522,068, Cl. 73-32.00A.
Electrolux Corporation: *See—*
Medwed, Peter M., 4,521,936, Cl. 15-377.000.
Electronics Corporation of Israel, Ltd.: *See—*
Piasecki, Joshua; Zelinkovsky, Reuven; Segev, Aharon; and Henquin, Teodor, 4,523,309, Cl. 370-81.000.
Elektro-Thermit GmbH: *See—*
Guntermann, Hans; and Skreba, Gerhard, 4,522,322, Cl. 222-597.000.
Eli Lilly and Company: *See—*
Ades, Edwin W.; and Cullinan, George J., 4,522,750, Cl. 260-112.00R.
Shreve, Barbara B.; and Turner, Jan R., 4,522,919, Cl. 435-119.000.
Ward, John S.; and Jones, C. David, 4,522,758, Cl. 260-397.500.
Elias, Moenes L.; and Burger, Walter L., to Plastic Specialties and Technologies, Inc. Dissolution of metals utilizing tungsten-diol combinations. 4,522,683, Cl. 156-666.000.
Elmar Industries, Inc.: *See—*
Minard, Everett S., 4,522,238, Cl. 141-142.000.
Eltec Instrument A.G.: *See—*
Keller-Steinbach, Christiane, 4,523,095, Cl. 250-349.000.
Emanuelson, Roy M.; and Lebet, David P., to Scanditronix Inc. Electromagnet. 4,523,168, Cl. 335-296.000.
Emerson Electric Co.: *See—*
Daniels, Nicholas R., 4,523,117, Cl. 310-71.000.
Hochstatter, Brian R., 4,522,454, Cl. 308-3.00R.
Endo, Keizo; Matsumura, Hiroshi; Hasunuma, Yoshifumi; Masai, Siro; and Oguma, Noboru, to Tokyo Tatsuno Co., Ltd. Apparatus for dispensing liquids. 4,522,237, Cl. 141-95.000.
Engel, Larry J.; and Turko, John W., to Michigan Consolidated Gas Co. Gaseous hydrocarbon fuel storage system and power plant for vehicles and associated refueling apparatus. 4,522,159, Cl. 123-1.00A.
Engelhard Corporation: *See—*
Hwang, Herng-Shinn; Heck, Ronald M.; and Yarrington, Robert M., 4,522,894, Cl. 429-17.000.
Engels, Hans-Werner: *See—*
Neuschaffer, Karl-Heinz; Engels, Hans-Werner; Gebert, Hans-Jurgen; Laube, Robert W.; and Zoche, Gunter, 4,522,652, Cl. 106-84.000.
Enright, Philip G.; Hughes, Ian R.; and Jordan, Richard M., to Alcan International Limited. Casting metals. 4,522,784, Cl. 420-590.000.
Entrepose Travaux Publics: *See—*
Grandpierre, Cyril M., 4,522,527, Cl. 403-49.000.
Eppstein, Deborah A.; Fraser-Smith, Elizabeth B.; and Matthews, Thomas R., to Syntex (U.S.A.) Inc. Serial injection of muramyldipeptides and liposomes enhances the anti-infective activity of muramyldipeptides. 4,522,811, Cl. 514-2.000.
Epson Corporation: *See—*
Iijima, Chiyoaki, 4,522,470, Cl. 350-350.00R.
Erdmann, Jurgen; Buchholz, Karl O.; and Knappe, Hartmut, to Erwin Sick GmbH Optik-Elektronik. Electronic apparatus comprising an input stage with a binary output connected to a relay control circuit. 4,523,251, Cl. 361-152.000.
Erhardt, Rainer: *See—*
Reinhardt, Erich; and Erhardt, Rainer, 4,523,278, Cl. 364-413.000.
Erickson, James R.: *See—*
Abbey, Kirk J.; and Erickson, James R., 4,522,962, Cl. 523-410.000.
Ericsson, Lars A.: *See—*
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Ernst, Hans-Hellmut, to Britax-Kolb GmbH & Co. Safety belt emergency locking retractor. 4,522,350, Cl. 242-107.40A.
Eruotungstene-Poudres: *See—*
Leclercq, Lucien; and Provost, Marcelle, 4,522,708, Cl. 208-136.000.
Erwin Sick GmbH Optik-Elektronik: *See—*
Erdmann, Jurgen; Buchholz, Karl O.; and Knappe, Hartmut, 4,523,251, Cl. 361-152.000.
Esco Corporation: *See—*
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Eshel Residual for Cooling and Heating Ltd.: *See—*
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, 4,522,720, Cl. 210-512.100.
Esmay, Donald L., to Minnesota Mining and Manufacturing Company. Linerless double-coated pressure-sensitive adhesive tape. 4,522,870, Cl. 428-252.000.
Esmil B.V.: *See—*
Klaren, Dick G., 4,522,252, Cl. 165-1.000.
Espenscheid, Wilton F., to Mobil Oil Corporation. Process for treating high-sulfur caking coals to inactivate the sulfur and eliminate caking tendencies thereof. 4,522,626, Cl. 44-1.00R.
Esrom, Hilmar, to Brown, Boveri & Cie AG. High-temperature storage battery. 4,522,898, Cl. 429-120.000.
ESS GmbH Skibindungen: *See—*
Jaeger, Knut, 4,522,422, Cl. 280-617.000.
Luitz, Max; and Weiss, Eugen, 4,522,424, Cl. 280-633.000.
Ethyl Corporation: *See—*
Li, Hsueh M., 4,522,795, Cl. 423-300.000.
Li, Hsueh M., 4,522,796, Cl. 423-300.000.
Lum, Genevieve S.; Li, Hsueh M.; and Pettigrew, F. Alexander, 4,522,798, Cl. 423-300.000.
Pettigrew, F. Alexander; Li, Hsueh M.; and Lum, Genevieve S., 4,522,797, Cl. 423-300.000.
Seemuth, Paul D., 4,522,630, Cl. 44-53.000.
Euverard, Maynard R.; Diver, James J.; and Schneider, Thomas C., to Velten & Pulver, Inc. Pattern forming apparatus and product orienter therefor. 4,522,292, Cl. 198-374.000.
Evans, Michael E.; and Oberg, Bradley W., to Owens-Corning Fiberglas Corporation. Insulated wall construction. 4,522,004, Cl. 52-409.000.
Eveque-Mourroux, Michel C., to Goodyear Tire & Rubber Company, The. Reinforcing belt for tires with a radial carcass. 4,522,243, Cl. 152-528.000.
Everitt, Delmar K.: *See—*
Goldfarb, Adolph E.; Everitt, Delmar K.; and Burger, Norman J., 4,522,606, Cl. 446-433.000.
Eversole, Jay D., to United States of America, Air Force. Multi-color X-ray line source. 4,523,327, Cl. 378-124.000.
Ewen, John A., to Exxon Research & Engineering Co. Isotactic-stereoblock polymers of alpha-olefins and process for producing the same. 4,522,982, Cl. 525-240.000.
Ewer, Ronald W.: *See—*
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Ewing, Channing B. Pharmaceutical methods using parabenzoquinone to treat muscle spasms. 4,522,830, Cl. 514-690.000.
Ewing, James H., to MKS Instruments, Inc. Laminar-flow channeling in thermal flowmeters and the like. 4,522,058, Cl. 73-202.000.
Excellon Industries: *See—*
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Exxon Production Research Co.: *See—*
Konak, A. Riza, 4,522,218, Cl. 137-3.000.
Exxon Research & Engineering Co.: *See—*
Achia, Biddanda U.; Shaw, David H.; and Bushnell, James D., 4,522,710, Cl. 208-349.000.
Bertsch, Carl F., 4,522,704, Cl. 208-113.000.
Ewen, John A., 4,522,982, Cl. 525-240.000.
Howkins, Stuart D., 4,523,200, Cl. 346-1.100.
Liker, Stephen J., 4,523,201, Cl. 346-1.100.

McVicker, Gary B.; Carter, James L.; Murrell, Lawrence L.; and Ziemiak, John J., 4,522,928, Cl. 502-26.000.
Mitchell, Howard L., III, 4,522,932, Cl. 502-153.000.
Ott, Robert J., 4,523,199, Cl. 346-1.100.
Peiffer, Dennis G.; and Lundberg, Robert D., 4,522,960, Cl. 523-339.000.
Wheelock, Kenneth S.; and Schucker, Robert C., 4,522,706, Cl. 208-121.000.

Eynon, David L.; Kingsnorth, Stanley W.; and Varma, Mani K., to Internationale Octrooi Maatschappij "Octropa" B.V. Flow box with two deflectors. 4,522,687, Cl. 162-336.000.

FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien: *See—*
Neese, Gerhard, 4,522,516, Cl. 384-572.000.
Schmitt, Gunther, 4,522,021, Cl. 57-88.000.

Fairchild Camera and Instrument Corporation: *See—*
Dvorak, Robert V., 4,523,143, Cl. 324-133.000.

Fairey Engineering Limited: *See—*
Parramore, Thomas S., 4,521,932, Cl. 14-2.400.

Faist, Clifford H.: *See—*
Mourao, Antonio M.; and Faist, Clifford H., 4,522,631, Cl. 44-57.000.

Falk, Gerhard, to Robert Bosch GmbH. Drive and mounting for coaxial tape reels. 4,522,352, Cl. 242-193.000.

Fanuc Ltd.: *See—*
Okuda, Kanemasa, 4,523,074, Cl. 219-69.00W.

Fanuc Ltd: *See—*
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,523,073, Cl. 219-69.00W.
Kishi, Hajimu; and Seki, Masaki, 4,523,270, Cl. 364-191.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Bargiotti, Alberto; Penco, Sergio; and Casazza, Anna M., 4,522,815, Cl. 514-34.000.

Farnhill, William M.: *See—*
Parker, Alan; and Farnhill, William M., 4,522,022, Cl. 57-401.000.

Faure, Michel: *See—*
Messe , Gerard; Faure, Michel; and Ducombs, Marcel, 4,522,094, Cl. 83-92.000.

Fayter, Richard G., Jr.; and Harris, Eugene G., to National Distillers and Chemical Corporation. Process for augmenting or enhancing the aroma of a fragrance by adding a vinylcyclopropane compound. 4,522,749, Cl. 252-522.00R.

Fayter, Richard G., Jr.: *See—*
Hall, Allen L.; and Fayter, Richard G., Jr., 4,522,950, Cl. 514-471.000.

Fearon, William W.; and Macy, Arnel M., to Peabody Noise Control, Inc. Composite panel structure. 4,522,284, Cl. 181-292.000.

Featherstone, John L.: *See—*
Gallup, Darrell L.; and Featherstone, John L., 4,522,728, Cl. 210-714.000.

Fedrick, Ronald M. Bottom-seated portable cofferdam and method of use. 4,522,532, Cl. 405-11.000.

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Feldmann, Herman F., to International Paper Company. Method of operating a spent pulping liquor combustion apparatus. 4,522,685, Cl. 162-30.110.

Feldmuhle Aktiengesellschaft: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,522,171, Cl. 123-270.000.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,522,415, Cl. 277-216.000.

Felice, Frank T., to Combustion Engineering, Inc. Aluminum resistant refractory composition. 4,522,926, Cl. 501-127.000.

Fell, Barry M.; and Ciriscioli, Peter R., to Hexcel Corporation. Heat insulating blanket. 4,522,673, Cl. 156-307.300.

Ferguson, Kenneth F. Shower flow controller. 4,522,232, Cl. 137-625.320.

Ferguson, Susan A.: *See—*
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Ferlan, Stephen J.: *See—*
Shallenberger, John M.; and Ferlan, Stephen J., 4,522,780, Cl. 376-260.000.

Ferrell, Roscoe M.: *See—*
Casstevens, Arvil; Coble, William H.; Shields, Harper; Ferrell, Roscoe M.; and Jordan, Bobby R., 4,522,042, Cl. 66-140.00S.

Ferrini, Pier G.: *See—*
Haas, Georges; von Sprecher, Andreas; and Ferrini, Pier G., 4,523,030, Cl. 562-460.000.

Fiarman, Sidney, to United States of America, Energy. Seal system with integral detector. 4,523,186, Cl. 340-555.000.

Figgie International: *See—*
Robinson, Chris E., 4,522,014, Cl. 53-382.000.

Figgie International Inc.: *See—*
Ansite, William K.; and Ryder, James H., 4,522,639, Cl. 55-314.000.

Finch, Harvey E.; and Trapanese, Salvatore P., to FPS Development Partnership. Olive oil recovery. 4,522,119, Cl. 99-483.000.

Fingerle, Dieter: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,522,171, Cl. 123-270.000.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,522,415, Cl. 277-216.000.

Fingerson, Conrad F. Lock rod system for flooring grating and method for assembling same. 4,522,009, Cl. 52-667.000.

Finkelmeier, Horst; and Hopp, Rudolf, to Haarmann & Reimer GmbH. Preparation of isochromane derivatives. 4,523,023, Cl. 549-385.000.

Finney, Robert H.: *See—*
Reyes, Peter A.; and Finney, Robert H., 4,522,563, Cl. 416-134.00A.

Firestone Tire & Rubber Company, The: *See—*
Kang, Jung W.; and Hall, James E., 4,522,988, Cl. 526-133.000.
Kang, Jung W., 4,522,989, Cl. 526-133.000.

Firmenich SA: *See—*
Maurer, Bruno; and Hauser, Arnold, 4,522,748, Cl. 252-522.00R.

Fischer, Dan E. Knitted gingival retraction cord. 4,522,593, Cl. 433-136.000.

Fischer, Paul M.; and Schwarz, Carl E., to Donaldson Company, Inc. Double-ended, spin-on fuel water separator. 4,522,712, Cl. 210-86.000.

Fisher, Almon P., to Xerox Corporation. Cleaning apparatus for a magnetographic printing device. 4,522,488, Cl. 355-15.000.

Fisher, John H.: *See—*
Pettigrew, Robert M.; Bradbrook, John D.; Smith, Alan M.; and Fisher, John H., 4,522,482, Cl. 355-3.00R.

Fisher, Sidney E., to Britax Weathershields Limited. Hinge comprising an arcuate spade member and an arcuate socket. 4,521,937, Cl. 16-332.000.

Fisher, Thomas M., to Reliance Electric Company. Telephone including resistive array for dialing and system for using such telephone. 4,523,056, Cl. 179-81.00R.

Fives-Cail Babcock: *See—*
Ghestem, Gerard, 4,521,978, Cl. 34-57.00R.
Lebesgue, Jean, 4,522,131, Cl. 110-229.000.

Flakt Aktiebolag: *See—*
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Flanagan, Elaine W., to Starmax, Inc. Interment arrangements for cremated remains. 4,521,999, Cl. 52-103.000.

Flanagan, Joseph E.: *See—*
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Flatscher, Georg: *See—*
Bayer, Erich; Beckerbauer, Anton; Flatscher, Georg; and Ullrich, Martin, 4,522,862, Cl. 428-195.000.

Flexwatt Corporation: *See—*
Grise, Frederick G. J., 4,523,085, Cl. 219-528.000.

Flohr, Peter: *See—*
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,523,283, Cl. 364-431.010.

Fluidmaster, Inc.: *See—*
Blau, Frederick, Jr.; Gross, John M.; and Vandermeyden, Tom R., 4,522,333, Cl. 236-20.00R.

Fogg, James L.; Vining, George E.; Smith, John H.; and Howell, Cecil A., to Westinghouse Electric Corp. Individual nuclear fuel rod weighing system. 4,522,276, Cl. 177-145.000.

Fohlen, George M.: *See—*
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,522,755, Cl. 260-245.750.

Fonash, Stephen J.: *See—*
Rohatgi, Ajeet; Rai-Choudhury, Prosenjit; Gigante, Joseph R.; Singh, Ranbir; and Fonash, Stephen J., 4,522,657, Cl. 148-1.500.

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Bains, William R.; and Sumrall, Calhoun W., 4,522,357, Cl. 244-3.220.

Ford Motor Company: *See—*
Bewers, Ronald, 4,522,528, Cl. 403-61.000.
Stockton, Thomas R., 4,522,565, Cl. 417-220.000.

Forsberg, Soren: *See—*
Nordin, Olof; and Forsberg, Soren, 4,522,669, Cl. 156-157.000.

Forsheda AB: *See—*
Nordin, Olof; and Forsberg, Soren, 4,522,669, Cl. 156-157.000.

Foster Wheeler Energy Corporation: *See—*
Stewart, Robert D.; and Gamble, Robert L., 4,521,976, Cl. 34-10.000.

Fountain, Michael W.: *See—*
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Fox, Charles L., Jr.; and Modak, Shanta M., to Norwich Eaton Pharmaceuticals, Inc. 1-Ethyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinoline carboxylic acid and metal salts thereof useful in burn therapy. 4,522,819, Cl. 514-187.000.

Fox, Clarence D.; and Baron, Tibor, to Borg-Warner Corporation. Proportional solenoid valve. 4,522,371, Cl. 251-139.000.

FPS Development Partnership: *See—*
Finch, Harvey E.; and Trapanese, Salvatore P., 4,522,119, Cl. 99-483.000.

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Leclercq, Joseph, 4,522,782, Cl. 376-438.000.

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Overall, Colin D.; and Francis, Leslie H., 4,522,309, Cl. 220-2.10A.

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Denzin, Horst; and Pach, Horst, 4,522,121, Cl. 101-92.000.

Frank, Werner, to Walther & Cie Aktiengesellschaft. Method and apparatus for automatic regulation of the operation of an electrostatic filter. 4,522,634, Cl. 55-2.000.

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Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,523,043, Cl. 568-840.000.

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Eppstein, Deborah A.; Fraser-Smith, Elizabeth B.; and Matthews, Thomas R., 4,522,811, Cl. 514-2.000.

Frazer, Benjamin F., to Dyneer Corporation. Balanced pulley construction. 4,522,612, Cl. 474-168.000.

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French, David W.: *See*—
Martin, William W., Jr.; and French, David W., 4,522,578, Cl. 425-110.000.

Frentzel, Richard L.; and Moss, Ernest K., to Celotex Corporation, The. Extraction of polyoxyalkylene surfactants for phenolic foam stabilization. 4,522,877, Cl. 428-304.400.

Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, to ITT Industries, Inc. Set of three integrated circuits for digital video signal processing in color-television receivers. 4,523,222, Cl. 358-27.000.

Frick, Kenneth L., to AT&T Bell Laboratories. Alarm-fault detecting system. 4,523,183, Cl. 340-507.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Kriegel, Ernst; and Coenen, Hubert, 4,522,707, Cl. 208-180.000.

Friesen, Wilmer J., to Vulcan Engineering Co. Segmented mold weight and combination with mold jacket. 4,522,248, Cl. 164-394.000.

Fritschel Scott J.: *See*—
Anderson, Arthur W.; Fritschel Scott J.; and Holmquist, Howard E., 4,522,995, Cl. 526-243.000.

Frye, John W., Jr. Rudder-tiller control system for a boat. 4,522,142, Cl. 114-163.000.

Fuchs, Andreas: *See*—
Harting, Jurgen; and Fuchs, Andreas, 4,522,829, Cl. 514-652.000.

Fudge, Chester: *See*—
Kasprzycki, Robert; and Fudge, Chester, 4,521,981, Cl. 40-2.00A.

Fuji Electric Company, Ltd.: *See*—
Kina, Hideki; Iijima, Toshiyuji; Tanabe, Eizo; Kazama, Toyoki; and Namba, Masaharu, 4,522,904, Cl. 430-54.000.

Fuji Electric Corporate Research & Development, Ltd.: *See*—
Kina, Hideki; Iijima, Toshiyuji; Tanabe, Eizo; Kazama, Toyoki; and Namba, Masaharu, 4,522,904, Cl. 430-54.000.

Fuji Photo Film Co., Ltd.: *See*—
Asao, Yasuzi; and Yamamoto, Ichiro, 4,522,906, Cl. 430-60.000.
Hirano, Tsumoru, 4,522,916, Cl. 430-548.000.
Hirose, Masataka; Kawajiri, Kazuhiro; and Nakajima, Yosuke, 4,523,214, Cl. 357-30.000.
Ichijima, Seiji; and Watanabe, Toshiyuki, 4,522,915, Cl. 430-505.000.
Ichijima, Seiji; Mihayashi, Keiji; and Itoh, Isamu, 4,522,917, Cl. 430-564.000.
Okuzawa, Yasutoshi, 4,523,246, Cl. 360-133.000.

Fuji Standard Research Kabushiki Kaisha: *See*—
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Tsutsui, Toshio; Nakagawa, Takao; and Miwa, Shigeru, 4,522,627, Cl. 44-1.00R.

Fujikawa, Kazuhiko: *See*—
Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; Fujikawa, Kazuhiko; and Tsumiyama, Takatoshi, 4,522,689, Cl. 203-52.000.

Fujimoto, Ryoichi: *See*—
Ochiai, Hideo; Nagoya, Yoshinari; Fujimoto, Ryoichi; Yamazaki, Susumu; Sasamoto, Nobuhiko; and Ishida, Shinichi, 4,522,040, Cl. 62-419.000.

Fujimura, Masayuki: *See*—
Toshimitsu, Naohiko; and Fujimura, Masayuki, 4,523,244, Cl. 360-129.000.

Fujimura, Toshiro: *See*—
Takenoya, Hideaki; Fujimura, Toshiro; Hara, Masanori; and Tonomura, Yoshinobu, 4,522,137, Cl. 112-266.100.

Fujioka, Akira: *See*—
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,522,966, Cl. 524-114.000.

Fujita, Yoshiji: *See*—
Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,523,024, Cl. 549-407.000.

Fujitsu Limited: *See*—
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,522,909, Cl. 430-137.000.
Takahara, Kazuhiro; Kurahashi, Keizo; Gondo, Hiroyuki; Oki, Kenichi; and Miura, Shoshin, 4,523,189, Cl. 340-781.000.
Tanizawa, Tetsu; Omichi, Hitoshi; and Mitono, Yoshiharu, 4,523,106, Cl. 307-303.000.

Fujiwara, Yoshio: *See*—
Kobayashi, Naotake; Abe, Tetsuya; and Fujiwara, Yoshio, 4,522,881, Cl. 428-336.000.

Fukahori, Hidehiko: *See*—
Iwashita, Tomonori; and Fukahori, Hidehiko, 4,522,477, Cl. 354-173.100.

Fukazawa, Nobuyuki: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,523,011, Cl. 544-238.000.

Fukuda, Hiroyuki: *See*—
Shigeta, Masatomo; Fukuda, Hiroyuki; Saitoh, Kuniyuki; and Kaji, Hisatsugu, 4,522,895, Cl. 429-44.000.

Fukuda, Mitsutoshi: *See*—
Koyama, Kenji; Ohno, Syotaro; and Fukuda, Mitsutoshi, 4,522,725, Cl. 210-639.000.

Fukuda Press Kogyo Kabushiki Kaisha: *See*—
Musumiya, Raita; Sano, Hideo; Izichi, Yasuto; Inoue, Mitsuru; and Izawa, Kenzyu, 4,522,082, Cl. 74-512.000.

Fukuda, Shinichi; and Odaka, Kentaro, to Sony Corporation. Method and apparatus for recording and reproducing an analog signal. 4,523,237, Cl. 360-8.000.

Fukui, Izumu: *See*—
Takahashi, Sadayuki; Yonezawa, Masatomo; Ochi, Atsushi; Yano, Takeshi; Hamatsuki, Takeshige; and Fukui, Izumu, 4,523,121, Cl. 310-334.000.

Fukui, Masahiro: *See*—
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,522,741, Cl. 252-299.630.

Fukuizumi, Hideaki: *See*—
Yoshinari, Osamu; Kawakatsu, Yoshifumi; and Fukuizumi, Hideaki, 4,522,801, Cl. 423-447.400.

Fukunaga, Yasushi; Bandoh, Tadaaki; Hiraoka, Ryosei; Matsumoto, Hidekazu; Ide, Jushi; and Kawakami, Tetsuya, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Bus selection control in a data transmission apparatus for a multiprocessor system. 4,523,272, Cl. 364-200.000.

Fukunaga, Yasushi; and Bandoh, Tadaaki, to Hitachi, Ltd. Data processing system with processors having different processing speeds sharing a common bus. 4,523,274, Cl. 364-200.000.

Fukuoka, Tatsuhiko: *See*—
Nozue, Shigehiro; and Fukuoka, Tatsuhiko, 4,522,513, Cl. 384-368.000.

Fukushima, Nobuo; Kitagawa, Yoshihiko; Okumura, Takuzo; and Sakakura, Kazuaki, to Sumitomo Chemical Company, Limited. Highly foamed polypropylene product and an extrusion process for forming the product. 4,522,955, Cl. 521-143.000.

Fukuta, Kinsho, to Toyota Jidosha Kabushiki Kaisha. Device for adjusting height of cushion in rear part of seat. 4,522,078, Cl. 74-89.150.

Fulhorst, George E. Wireless alarm system in conjunction with at least one vehicle. 4,523,178, Cl. 340-64.000.

Fulks, Ronald T.: *See*—
Powell, Ronald A.; and Fulks, Ronald T., 4,522,845, Cl. 427-53.100.

Funabashi, Motohisa: *See*—
Wakamori, Fumio; Noma, Toshiyuki; Adachi, Masao; Funabashi, Motohisa; and Suzuki, Masayoshi, 4,522,534, Cl. 405-37.000.

Funahashi, Masaya; Inoue, Kenichi; and Mizushima, Kunio, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,522,885, Cl. 428-422.000.

Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, to Nippon Sheet Glass Co., Ltd.; and Sumitomo Chemical Company, Limited. Non-fogging coating composition and a shaped article coated therewith. 4,522,966, Cl. 524-114.000.

Funakoshi, Keigo; and Ametani, Minoru, to Nitto Electric Industrial Co., Ltd. Apparatus for sticking adhesive film on a ring and a thin article. 4,522,679, Cl. 156-510.000.

Furujho, Sakae: *See*—
Nakajima, Hidemasa; Okamura, Shozo; Sueyasu, Masanobu; Furujho, Sakae; Okane, Kohji; and Anezaki, Shoji, 4,522,650, Cl. 75-48.000.

Furukawa, Yoshimi: *See*—
Sano, Shoichi; and Furukawa, Yoshimi, 4,522,416, Cl. 280-91.000.
Sano, Shoichi; and Furukawa, Yoshimi, 4,522,417, Cl. 280-91.000.

Furukawa, Yutaka: *See*—
Matsuoka, Hiroshi; and Furukawa, Yutaka, 4,522,614, Cl. 474-260.000.

Fuse, Takahiro: *See*—
Kameda, Osamu; and Fuse, Takahiro, 4,523,232, Cl. 358-236.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,523,211, Cl. 357-4.000.

G. D. Searle & Co.: *See*—
Moormann, Alan E.; Pitzele, Barnett S.; and Jones, Peter H., 4,523,020, Cl. 548-353.000.

G.D Societa per Azioni: *See*—
Seragnoli, Enzo, 4,522,295, Cl. 198-493.000.

GA Technologies Inc.: *See*—
Moeller, Charles P., 4,523,127, Cl. 315-4.000.

GAF Corporation: *See*—
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,523,004, Cl. 528-76.000.

Gagnol, Jean-Pierre: *See*—
Wagnon, Jean; Gautier, Patrick; and Gagnol, Jean-Pierre, 4,522,824, Cl. 514-414.000.

Gaitten, Dorothy A., executrix: *See*—
Gaitten, Walden M., deceased, 4,522,239, Cl. 144-2.00Z.

Gaitten, Walden M., deceased (by Gaitten, Dorothy A., executrix), to Southeastern Technology, Inc. Swath cutting and gripping tree delimber. 4,522,239, Cl. 144-2.00Z.

Gale, Edwin J.: *See*—
Valentine, Gordon A.; and Gale, Edwin J., 4,522,433, Cl. 285-93.000.

Gallant, Ben J., to Cooper LaserSonics, Inc. Equipment and method for delivering an abrasive-laden gas stream. 4,522,597, Cl. 433-216.000.

Gallivan, Timothy J.: *See*—
Connolly, John D., Jr.; Gallivan, Timothy J.; and Ringle, Richard P., 4,522,769, Cl. 264-0.500.

Gallup, Darrell L.; and Featherstone, John L., to Union Oil Company of California; Mono Power Company; and Southern Pacific Land

Company. Acidifiction of steam condensate for incompatibility control during mixing with geothermal brine. 4,522,728, Cl. 210-714.000.
Gamble, Robert L.: *See*—
Stewart, Robert D.; and Gamble, Robert L., 4,521,976, Cl. 34-10.000.
Gamblin, Rodger L., to Burlington Industries, Inc. Random droplet liquid jet apparatus and process. 4,523,202, Cl. 346-75.000.
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, to Fanuc Ltd. Wire-cut electric discharge machine controller for compensating the machining cornering parameters. 4,523,073, Cl. 219-69.00W.
Gandrud, Dale E., to Gandy Company. Granular material applicator with speed compensator. 4,522,340, Cl. 239-654.000.
Gandy Company: *See*—
Gandrud, Dale E., 4,522,340, Cl. 239-654.000.
Ganson, John P. Apparatus and method for showing motion in a single photograph. 4,522,475, Cl. 352-39.000.
GAO Gesellschaft fur Automation und Organisation GmbH: *See*—
Leuthold, Karl, 4,522,387, Cl. 271-187.000.
Garbis, Dennis; Chan, Joseph Y.; Granata, Amedeo J.; and Heller, Robert C., to General Instrument Corp. Reactor and susceptor for chemical vapor deposition process. 4,522,149, Cl. 118-725.000.
Garde, Peter, to Unisearch Limited. High-efficiency feedforward-error-correction amplifier. 4,523,152, Cl. 330-151.000.
Gardner, Hugh C., to Union Carbide Corporation. Process for producing dicyclopentadienyl-modified polyester compositions. 4,522,977, Cl. 525-48.000.
Gardner, Hugh C., to Union Carbide Corporation. Low viscosity, dicyclopentadienyl-modified polyester compositions and a process for the preparation thereof. 4,522,978, Cl. 525-48.000.
Gardner, Lloyd E.: *See*—
Aldag, Arthur W., Jr.; and Gardner, Lloyd E., 4,522,709, Cl. 208-216.00R.
Gardner, Norman A.; and Voticky, Michael P., to Nocopi Inc. Method of rendering documents resistant to photocopying, and anti-copying paper and ink therefor. 4,522,429, Cl. 283-91.000.
Garrett, William R.: *See*—
Kellner, Jackson M.; and Garrett, William R., 4,522,234, Cl. 138-108.000.
Gasiunas, Donatas V.: *See*—
Hohl, G. Burnell; and Gasiunas, Donatas V., 4,523,055, Cl. 179-2.0DP.
Gassmann, Wolfgang: *See*—
Goldner, Walther; and Gassmann, Wolfgang, 4,522,445, Cl. 297-284.000.
Gautier, Patrick: *See*—
Wagnon, Jean; Gautier, Patrick; and Gagnol, Jean-Pierre, 4,522,824, Cl. 514-414.000.
Gawel, Henry A.: *See*—
Horodysky, Andrew G.; Ashjian, Henry; and Gawel, Henry A., 4,522,734, Cl. 252-49.600.
Gearhart Industries, Inc.: *See*—
Maciejewski, Walter J., 4,523,148, Cl. 324-351.000.
Gebert, Hans-Jurgen: *See*—
Neuschaffer, Karl-Heinz; Engels, Hans-Werner; Gebert, Hans-Jurgen; Laube, Robert W.; and Zoche, Gunter, 4,522,652, Cl. 106-84.000.
Gebr. Hennig GmbH: *See*—
Bierbrauer, Heiner; and Diels, Wolfgang, 4,522,246, Cl. 160-223.000.
Gebruder Schmidt GMBH & Co. KG: *See*—
Schmidt, Karl W., 4,522,509, Cl. 368-300.000.
Geib, Henry T., Sr.; and Griffith, Wayne C., to M. P. Metal Products, Inc. Forced air baseboard heater and air duct diffuser. 4,523,081, Cl. 219-370.000.
Geipel, Werner: *See*—
Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, 4,522,767, Cl. 261-94.000.
Geist, Michael, to BASF Farben & Fasern AG. Synthetic resin. 4,522,981, Cl. 525-124.000.
Geke, Jurgen: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,522,740, Cl. 252-174.210.
Gelinas, Sandra L.; Cerundolo, Daniel G.; and Abele, John E., to Mansfield Scientific, Inc. Endocardial electrode. 4,522,212, Cl. 128-642.000.
Gelse, Hans-Dieter; Heger, Werner; and Kramer, Manfred, to WABCO Fahrzeugbremsen GmbH. Compressor apparatus. 4,522,568, Cl. 417-307.000.
Gemignani, Andre . Pilot-controlled safety valve. 4,522,369, Cl. 251-61.500.
Gene West, Inc.: *See*—
West, Gene P., 4,522,241, Cl. 144-193.00A.
General Dynamics, Pomona Division: *See*—
Lair, Clair K.; Jonas, Jules; and Anderson, Keith D., 4,522,356, Cl. 244-3.150.
General Electric Company: *See*—
Anderson, John M., 4,523,125, Cl. 313-491.000.
Baliga, Bantval J., 4,523,111, Cl. 307-574.000.
Bell, Gordon M.; and Hopkinson, Philip J., 4,521,956, Cl. 29-605.000.
Burge, Joseph C.; and Bathori, Julius, 4,522,559, Cl. 415-196.000.
Campbell, John R.; and Williams, Robert E., Jr., 4,523,002, Cl. 528-26.000.
Closson, James M.; and Hay, Noah D., 4,521,955, Cl. 29-605.000.
Connolly, John D., Jr.; Gallivan, Timothy J.; and Ringle, Richard P., 4,522,769, Cl. 264-0.500.
Cunningham, Eldon R., 4,523,118, Cl. 310-90.000.
Devins, John C.; and Sharbaugh, Amandus H., 4,522,065, Cl. 73-705.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,522,888, Cl. 428-546.000.
Gigliotti, Michael F. X., Jr.; Yang, Swe-Wong; Jackson, Melvin R.; Bruch, Charles A.; and Nguyen-Dinh, Xuan, 4,522,664, Cl. 148-404.000.
Gorowitz, Bernard; and Saia, Richard J., 4,522,681, Cl. 156-643.000.
Gross, Dan A., 4,523,166, Cl. 335-216.000.
Hammer, Edward E.; and Beck, Charles E., 4,523,126, Cl. 313-594.000.
Hanson, John R.; Hauser, James L.; Kilfeather, James F., Jr.; and Hendriks, Hendrik B., 4,522,667, Cl. 156-87.000.
Hay, Noah D., 4,523,169, Cl. 336-60.000.
King, James L.; and Hennessy, John E., 4,521,953, Cl. 29-596.000.
Laskaris, Evangelos T., 4,522,034, Cl. 62-45.000.
Lewandowski, Robert S., 4,522,849, Cl. 427-237.000.
McLeod, Ramon M., 4,521,957, Cl. 29-609.000.
McLoughlin, Joseph R., 4,522,771, Cl. 264-61.000.
Miller, Kenneth F., 4,522,980, Cl. 525-67.000.
Peters, Edward N., 4,523,006, Cl. 528-172.000.
Rademaker, Leo C.; Hopkinson, Philip J.; Bell, Gordon M.; and Hay, Noah D., 4,521,954, Cl. 29-605.000.
Ryang, Hong-Son, 4,522,985, Cl. 525-431.000.
Staats, James E., 4,523,069, Cl. 219-10.55D.
Swiger, Roger T.; and Hallgren, John E., 4,523,001, Cl. 528-18.000.
General Foods Corporation: *See*—
Rattmann, James A., 4,522,093, Cl. 83-42.000.
General Indicator Corporation: *See*—
Murray, Ledell L., 4,521,984, Cl. 40-576.000.
General Instrument Corp.: *See*—
Garbis, Dennis; Chan, Joseph Y.; Granata, Amedeo J.; and Heller, Robert C., 4,522,149, Cl. 118-725.000.
General Motors Corporation: *See*—
Mackin, Steven J.; and Tillotson, Harry T., 4,522,081, Cl. 74-473.00R.
Short, William T.; and Ottaviani, Robert A., 4,522,986, Cl. 525-458.000.
General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,523,197, Cl. 343-702.000.
Genetic Diagnostics Corporation: *See*—
Deutsch, Alice; and Platt, Herbert, 4,522,923, Cl. 436-536.000.
GenRad, Inc.: *See*—
Congdon, James S., 4,523,154, Cl. 330-266.000.
GEO Vann, Inc.: *See*—
Yates, Donald N., Jr.; and Oestrich, Michael, 4,522,665, Cl. 149-21.000.
Georgia-Pacific Corporation: *See*—
Jespersen, Paul W., 4,522,346, Cl. 242-55.300.
Gerber, Hans-Adolf: *See*—
Kuhn-Kuhnenfeld, Franz; Kramler, Josef; and Gerber, Hans-Adolf, 4,522,656, Cl. 148-1.500.
Gerhard, Helmut, to Westerwalder Eisenwerk Gerhard GmbH. Corner fitting for freight containers. 4,521,941, Cl. 24-287.000.
Gerhardt, Glenn E.: *See*—
Lagow, Richard J.; and Gerhardt, Glenn E., 4,523,039, Cl. 568-615.000.
Germscheid, Hans-Gunther: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,522,740, Cl. 252-174.210.
Gershman, Leonard. Cat litter disposal housing. 4,522,150, Cl. 119-1.000.
Gervais, William J.: *See*—
Dunstan, Ericson M.; Gervais, William J.; and McClelland, S. Barry, 4,523,240, Cl. 360-99.000.
Getronics AB: *See*—
Wiklund, Klas R.; and Ericsson, Lars A., 4,521,973, Cl. 33-366.000.
GH TTE: *See*—
Heilhecker, Joseph K.; and Byrne, James E., 4,522,450, Cl. 303-9.000.
Ghestem, Gerard, to Fives-Cail Babcock. Heat exchanger for thermally treating a pulverulent material. 4,521,978, Cl. 34-57.00R.
Gibbs, Andrew R., to Stanley Tools Limited. Dowelling jig. 4,522,539, Cl. 408-72.00R.
Gieraths, Wolfgang, to Dornier System GmbH. Test equipment for a synthetic aperture radar system. 4,523,196, Cl. 343-17.700.
Giese, Emil; Maurer, Ruprecht; and Hagen, Max, to Ringspann Albrecht Maurer K.G. Retainer ring for a freewheel clutch. 4,522,289, Cl. 192-41.00A.
Giesecke, Henning: *See*—
Ebneth, Harold; Wolf, Gerhard D.; and Giesecke, Henning, 4,522,889, Cl. 428-614.000.
Gigante, Joseph R.: *See*—
Rohatgi, Ajeet; Rai-Choudhury, Prosenjit; Gigante, Joseph R.; Singh, Ranbir; and Fonash, Stephen J., 4,522,657, Cl. 148-1.500.
Gigliotti, Michael F. X., Jr.; Yang, Swe-Wong; Jackson, Melvin R.; Bruch, Charles A.; and Nguyen-Dinh, Xuan, to General Electric Company. Phase stable carbide reinforced nickel-base superalloy eutectics having improved high temperature stress-rupture strength

and improved resistance to surface carbide formation. 4,522,664, Cl. 148-404.000.

Gille, Etienne; Lucas, Jean; Mechineau, Didier; and Monod, Marie-Odile, to Centre National Du Machinisme Agricole, Du Genie Rural, Des Eaux et des Forets (Cemagref). Process for the stabilization with respect to a desired path of a member which is movably mounted according to at least one component of movement and its application to the stabilization of a spray manifold. 4,522,841, Cl. 427-4.000.

Gilliams, Yvan K.: *See*—
de Winter, Walter F.; Uytterhoeven, Herman J.; Gilliams, Yvan K.; and De Volder, Noel J., 4,522,908, Cl. 430-114.000.

Gilligan, Thomas J., to Ampex Corporation. Core memory with return drive scheme. 4,523,302, Cl. 365-195.000.

Girard, Thomas L.; and Lewis, Monty D., to Indoor Activities Unlimited. Game ball. 4,522,396, Cl. 273-58.00K.

Giubbolini, Marco; and Marziali, Walter, to Selenia-Industrie Elettroniche Associate S.p.A. Device for estimating the operating frequency of a source of recurrent signals. 4,523,291, Cl. 364-724.000.

Glaverbel: *See*—
Cornet, Julien; and Van Laethem, Robert, 4,522,847, Cl. 427-55.000.

Gleman, Jon F. Log loading tool. 4,522,437, Cl. 294-9.000.

Glowacki, Pierre A.; and Mandet, Gerard M. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A. Turbine rotor cooling. 4,522,562, Cl. 416-95.000.

GME, Inc.: *See*—
Hamilton, Glen T., 4,522,013, Cl. 53-220.000.

GNB Batteries Inc.: *See*—
Lund, David L.; Majumdar, Senajit J.; Mullane, William E.; and Krivanek, Louis, 4,523,068, Cl. 219-10.530.

Goldfarb, Adolph E.; Everitt, Delmar K.; and Burger, Norman J., to Everitt, Delmar K.; and Burger, Norman J. Self-powered miniature toy vehicle with treads and with unusual four-wheel-drive climbing capability. 4,522,606, Cl. 446-433.000.

Goldin, Reeni: *See*—
Nibby, Chester M., Jr.; Goldin, Reeni; and Andrews, Timothy A., 4,523,313, Cl. 371-10.000.

Goldner, Walther; and Gassmann, Wolfgang, to Keiper Recaro GmbH & Co. Vehicle seat, particularly a motor vehicle seat. 4,522,445, Cl. 297-284.000.

Goldring, Stanley D.: *See*—
Sperinde, Johnie M.; Goldring, Stanley D.; and Miller, Dean T., 4,523,279, Cl. 364-416.000.

Golner, Jerold J.: *See*—
Strout, Russell B.; and Golner, Jerold J., 4,522,348, Cl. 242-96.000.

Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Tsutsui, Toshio; Nakagawa, Takao; and Miwa, Shigeru, to Fuji Standard Research Kabushiki Kaisha. Process for producing oil-containing, microspherical carbonaceous particles. 4,522,627, Cl. 44-1.00R.

Goncalves, Antonin, to L'Oreal. Dosage dispenser device for a viscous product. 4,522,317, Cl. 222-391.000.

Gondo, Hiroyuki: *See*—
Takahara, Kazuhiro; Kurahashi, Keizo; Gondo, Hiroyuki; Oki, Kenichi; and Miura, Shoshin, 4,523,189, Cl. 340-781.000.

Goodman, Mark M.: *See*—
Knapp, Furn F., Jr.; and Goodman, Mark M., 4,523,033, Cl. 562-496.000.

Goodwin, Norman W.: *See*—
Brown, Roger H.; Chow, Kuen; Goodwin, Norman W.; and Grinberg, Jan, 4,523,067, Cl. 219-10.49R.

Goodyear Aerospace Corporation: *See*—
Beck, Arnold A., 4,523,282, Cl. 364-426.000.

Goodyear Tire & Rubber Company, The: *See*—
Eveque-Mourroux, Michel C., 4,522,243, Cl. 152-528.000.
Kluss, Karl K.; Allen, Terry F.; and Sawyer, John M., 4,522,235, Cl. 138-130.000.
Scriver, Richard M.; and Stair, Wayne H., 4,522,970, Cl. 524-447.000.

Gordon, Norman. Tooth and gum dentifrice. 4,522,805, Cl. 424-52.000.

Gorowitz, Bernard; and Saia, Richard J., to General Electric Company. Method for tapered dry etching. 4,522,681, Cl. 156-643.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Fan drive system for transverse engine. 4,522,609, Cl. 474-62.000.

Goscianski, Michel, to U.S. Philips Corporation. Information display device having a liquid crystal cell. 4,522,468, Cl. 350-332.000.

Gosho, Nobuyuki: *See*—
Nakate, Hiroshi; Kondo, Masatoshi; and Gosho, Nobuyuki, 4,523,072, Cl. 219-67.000.

Gossens, Peter: *See*—
Heinen, Peter; and Gossens, Peter, 4,521,945, Cl. 28-273.000.

Gostomski, Richard B. Raisable cover. 4,522,440, Cl. 296-100.000.

Goto, Yasuyuki: *See*—
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Gould Computer Systems Inc.: *See*—
Brown, William H.; Starkweather, James A.; and Humphreys, Hugh M., 4,523,310, Cl. 370-112.000.

Gould, Gordon: *See*—
Thompson, Robert E.; Gould, Gordon; and Soodak, Charles I., 4,522,464, Cl. 350-96.230.

Gould, Ronald M.; and Yurchak, Sergei, to Mobil Oil Corporation. Method for gasoline yield enhancement in the fixed bed methanol-to-gasoline process. 4,523,046, Cl. 585-322.000.

Grace, Oscar M.; Wujcik, Steven E.; and Heyman, Duane A., to BASF Wyandotte Corporation. Graft polymer dispersion in a mixture of low molecular weight polyols and polyether polyols and polyurethane foams prepared therefrom. 4,522,976, Cl. 524-722.000.

Graco Inc.: *See*—
Kelly, Lawrence S.; McCormick Marty P.; and Weikel, William A., 4,522,789, Cl. 422-133.000.

Gradle, Richard J.: *See*—
Clapper, Robert L.; Gradle, Richard J.; and Bake, Earl A., 4,522,230, Cl. 137-496.000.

Graff, Roderich W. Method and an apparatus for extracting gases and vapors from a drying hopper filled with bulk material. 4,521,977, Cl. 34-32.000.

Granata, Amedeo J.: *See*—
Garbis, Dennis; Chan, Joseph Y.; Granata, Amedeo J.; and Heller, Robert C., 4,522,149, Cl. 118-725.000.

Grandpierre, Cyril M., to Entrepose Travaux Publics. Tubular-type scaffoldings, method for assembling them and to the horizontal transoms incorporated therein. 4,522,527, Cl. 403-49.000.

Gray, Frederick W., to Colgate-Palmolive Company. Activated peroxy compound bleaching compositions and bleaching detergent compositions and process of using same. 4,522,739, Cl. 252-95.000.

Gray, George G., Jr., to Raytheon Company. Apparatus for the automated handling and testing of electronic modules. 4,523,145, Cl. 324-158.00F.

Green, Arlene. Disposable toothbrush with integral dentifrice. 4,522,524, Cl. 401-183.000.

Green, Gregory M.: *See*—
Johnston, Charles R.; and Green, Gregory M., 4,521,935, Cl. 15-322.000.

Green, Robert H.; and Simon, James D. Splitting wedge for log splitter. 4,522,240, Cl. 144-193.00E.

Greenman, Edwin G.: *See*—
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Greenwood, William S., to Thomas & Betts Corporation. Apparatus for electrical connection of multiconductor cables. 4,521,969, Cl. 33-180.00R.

Gregory, James N.: *See*—
Bodine, Albert G.; and Gregory, James N., 4,522,271, Cl. 175-56.000.

Greigger, Paul P.: *See*—
Das, Suryya K.; Boberski, William G.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,522,958, Cl. 523-212.000.

Greiner, Max; and Konrath, Karl, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,522,181, Cl. 123-502.000.

Greschner, Johann: *See*—
Bohlen, Harald; Kaus, Gerhard; Greschner, Johann; Keyser, Joachim H.; and Kulcke, Werner, 4,522,893, Cl. 428-641.000.

Greskovics, Paul: *See*—
Chivens, Donald R.; Greskovics, Paul; and Kelm, Edward C., 4,522,221, Cl. 137-118.000.

Greune, Christian; and Kummeke, Heinrich, to MTU. Apparatus for controlling load distribution and speed of gas speed of gas turbine systems and particularly of gas turbine engines. 4,522,025, Cl. 60-39.150.

Greverath, Peter H., to Pyles Division. Linear in-line mixing system. 4,522,504, Cl. 366-339.000.

Gries, Heinz; and Mutzel, Wolfgang, to Schering Aktiengesellschaft. 3-Substituted 2,4,6-trihalogenated benzamides as sweetening agents. 4,522,839, Cl. 426-548.000.

Griffith, Wayne C.: *See*—
Geib, Henry T., Sr.; and Griffith, Wayne C., 4,523,081, Cl. 219-370.000.

Grigoleit, Georg; Oberkobusch, Rudolf; Stadelhofer, Jurgen; and Matern, Kurt, to Rutgerswerke Aktiengesellschaft. Process for the catalytic dehydrogenation of piperidine. 4,523,016, Cl. 546-252.000.

Grimm, Thomas H.: *See*—
Kilroy, Eugene J.; Morse, James E.; Grimm, Thomas H.; and DeAnda, Nicholas, 4,522,607, Cl. 446-447.000.

Grinberg, Jan: *See*—
Brown, Roger H.; Chow, Kuen; Goodwin, Norman W.; and Grinberg, Jan, 4,523,067, Cl. 219-10.49R.

Grise, Frederick G. J., to Flexwatt Corporation. Electrical heating device. 4,523,085, Cl. 219-528.000.

Gromelski, Stanley J., Jr.: *See*—
Lin, I. Sioun; Gromelski, Stanley J., Jr.; Werner, Jesse; Brown, Michael J.; and Chakrabarti, Paritosh M., 4,523,004, Cl. 528-76.000.

Gronauer, Thomas W.: *See*—
O'Sullivan, Thomas F.; and Gronauer, Thomas W., 4,522,157, Cl. 122-510.000.

Gross, Dan A., to General Electric Company. Optimal field inhomogeneity correction coil operation for NMR magnets. 4,523,166, Cl. 335-216.000.

Gross, John M.: *See*—
Blau, Frederick, Jr.; Gross, John M.; and Vandermeyden, Tom R., 4,522,333, Cl. 236-20.00R.

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Lindig, Charles E.; Brandstetter, Robert W.; and Doucette, Adrian R., 4,522,466, Cl. 350-162.120.

Grunberg, Kurt; Poth, Rainer; Werner, Peter; Koch, Kurt; Schweppe, Friedrich; and Voigtlander, Kurt, to Siemens Aktiengesellschaft. Encapsulated medium-voltage electrical load switching apparatus. 4,523,253, Cl. 361-335.000.

Grund, Peter; and Holz, Peter, to Messer Griesheim GmbH. Centrifugal throwing wheel for ejection of blasting materials onto workpieces. 4,521,996, Cl. 51-434.000.

Grundig E. M. V.: *See—*
Bauerschmidt, Werner, 4,523,151, Cl. 329-124.000.

Gruner, Heiko: *See—*
Burger, Kurt; and Gruner, Heiko, 4,522,067, Cl. 73-862.650.

Grunwald, Werner; Pfizenmaier, Heinz; de la Prieta, Claudio; Schmid, Kurt; and Schmidt, Ewald, to Robert Bosch GmbH. Method of applying an electrical conductor pattern on an apertured substrate. 4,522,671, Cl. 156-235.000.

GTE Automatic Electric Laboratories, Incorporated: *See—*
Kapral, Christopher W., 4,523,179, Cl. 340-347.0DA.

GTE Business Communication Systems: *See—*
Boeckmann, Eduard F. B., 4,523,057, Cl. 179-81.00B.

GTE Laboratories Incorporated: *See—*
Berger, Eric V., 4,522,055, Cl. 72-477.000.

GTE Valeron Corporation: *See—*
Kroetsch, Charles F., 4,523,063, Cl. 200-61.410.

Guay, Lawrence A., Jr. Gravity-operated toy. 4,522,605, Cl. 446-228.000.

Gubitosa, Giuseppe; Berton, Antonio; Pernicone, Nicola; and Vidotto, Graziano, to Montepolimeri S.p.A. Method for the preparation of supported catalysts and supported catalysts thus obtained. 4,522,931, Cl. 502-150.000.

Gummelt, Klaus: *See—*
Illmann, Joachim; and Gummelt, Klaus, 4,522,899, Cl. 429-181.000.

Guntermann, Hans; and Skreba, Gerhard, to Elektro-Thermit GmbH. Self-opening closure for a casting crucible used in aluminothermic reactions. 4,522,322, Cl. 222-597.000.

Gurtner, Bernard: *See—*
Commandeur, Raymond; and Gurtner, Bernard, 4,523,044, Cl. 585-11.000.

Gustafson, William O. Manipulatable puzzle toy. 4,522,401, Cl. 273-153.00S.

Haacker, Heinz: *See—*
Vollhardt, Frohmut; and Haacker, Heinz, 4,522,155, Cl. 122-7.00R.

Haarmann & Reimer GmbH: *See—*
Finkelmeier, Horst; and Hopp, Rudolf, 4,523,023, Cl. 549-385.000.

Haas, Georges; von Sprecher, Andreas; and Ferrini, Pier G., to Ciba-Geigy Corporation. Benzophenones. 4,523,030, Cl. 562-460.000.

Haberkorn, Wilhelm A.: *See—*
Donnelly, Edward N.; Haberkorn, Wilhelm A.; Hagen, Gerry A.; McGregor, Thomas R.; and Postman, William, 4,522,774, Cl. 264-168.000.

Hachiro, Nobuaki: *See—*
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,522,108, Cl. 91-376.00R.

Hafner, Hans W., to Pfister GmbH. Apparatus for measuring several force components. 4,522,074, Cl. 73-862.040.

Haga, Ryoichi: *See—*
Ishida, Masahiko; and Haga, Ryoichi, 4,522,721, Cl. 210-603.000.

Hagedorn, Floyd T.; and Koontz, Merwyn L., to Libbey-Owens-Ford Company. Apparatus for bending glass sheets. 4,522,641, Cl. 65-291.000.

Hagen, Floyd W., to Rosemount Inc. Method and apparatus for correcting barometric pressure for wind velocity and direction. 4,522,070, Cl. 73-384.000.

Hagen, Gerry A.: *See—*
Donnelly, Edward N.; Haberkorn, Wilhelm A.; Hagen, Gerry A.; McGregor, Thomas R.; and Postman, William, 4,522,774, Cl. 264-168.000.

Hagen, Helmut: *See—*
Markert, Jurgen; Hagen, Helmut; and Wuerzer, Bruno, 4,522,646, Cl. 71-94.000.

Hagen, Max: *See—*
Giese, Emil; Maurer, Ruprecht; and Hagen, Max, 4,522,289, Cl. 192-41.00A.

Hahn, Paul L. Strike indicator and hook setter, combined. 4,522,572, Cl. 43-16.000.

Haldemann A.G.: *See—*
Haldemann, Gaston; and Wirz, Francois, 4,522,423, Cl. 280-624.000.

Haldemann, Gaston; and Wirz, Francois, to Haldemann A.G. Safety binding of a boot on a ski. 4,522,423, Cl. 280-624.000.

Hale, William D.: *See—*
Chen, Tyen C.; Busching, Forrest B.; Hale, William D.; and Kristoffersen, Bjorn R., 4,521,925, Cl. 4-362.000.

Haley, William J., to Borg-Warner Corporation. Control system for continuously variable transmission. 4,522,086, Cl. 74-867.000.

Hall, Allen L.; and Fayter, Richard G., Jr., to National Distillers and Chemical Corporation. 2,3-Dihydrofurans useful as fungicides. 4,522,950, Cl. 514-471.000.

Hall, James E.: *See—*
Kang, Jung W.; and Hall, James E., 4,522,988, Cl. 526-133.000.

Hall, Karen: *See—*
Berczi, Charles N.; and Hall, Karen, 4,522,872, Cl. 428-257.000.

Hallgren, John E.: *See—*
Swiger, Roger T.; and Hallgren, John E., 4,523,001, Cl. 528-18.000.

Halliburton Company: *See—*
Barrington, Burchus Q., 4,522,266, Cl. 166-330.000.
Rao, S. Prabhakara; Brothers, Lance E.; and Brake, Bobby G., 4,522,653, Cl. 106-90.000.
Stromberg, James L., 4,522,430, Cl. 285-24.000.
Walker, Michael L., 4,522,658, Cl. 148-6.14R.

Hallman, Robert W., to Napp Systems (USA), Inc. Photosensitive graphic arts article. 4,522,910, Cl. 430-157.000.

Hamanishi, Makio: *See—*
Kawai, Hisasi; Ina, Toshikazu; Igashira, Toshihiko; Nomura, Ken; Yoshida, Masakazu; Komoda, Takao; and Hamanishi, Makio, 4,522,177, Cl. 123-478.000.

Hamaoka, Hidetoshi: *See—*
Koga, Tsuguaki; Kuwashima, Hidesumi; Inoue, Hidenori; Hamaoka, Hidetoshi; and Ohta, Hiroshi, 4,523,286, Cl. 364-494.000.

Hamatsuki, Takeshige: *See—*
Takahashi, Sadayuki; Yonezawa, Masatomo; Ochi, Atsushi; Yano, Takeshi; Hamatsuki, Takeshige; and Fukui, Izumu, 4,523,121, Cl. 310-334.000.

Hamblet, Newman. Club protective devices for golf bags. 4,522,300, Cl. 206-315.400.

Hamilton-Dunn Research Co.: *See—*
Hamilton, William H., 4,523,083, Cl. 219-433.000.

Hamilton, Glen T., to GME, Inc. Yieldable platform for food wrapping machine. 4,522,013, Cl. 53-220.000.

Hamilton-Pax, Inc.: *See—*
Laue, Charles E., 4,521,948, Cl. 29-157.10R.

Hamilton, William H., to Hamilton-Dunn Research Co. Beverage warmer. 4,523,083, Cl. 219-433.000.

Hammer, Edward E.; and Beck, Charles E., to General Electric Company. Shaped discharge lamp with starting aid. 4,523,126, Cl. 313-594.000.

Hamprecht, Gerhard, to BASF Aktiengesellschaft. N-Alkoxycarbonyl- and N-alkoxythiocarbonyl-amidines and their preparation. 4,522,763, Cl. 260-455.00A.

Hamprecht, Gerhard: *See—*
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,523,034, Cl. 564-79.000.

Hand, Patricia H.: *See—*
Schlom, Jeffery; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,522,918, Cl. 435-68.000.

Hanebrink, Daniel E.: *See—*
Cornwall, Harry J.; and Hanebrink, Daniel E., 4,522,425, Cl. 280-656.000.

Haney, Keith M., to Walker-Neer Manufacturing Co., Inc. Automatic pipe elevator. 4,522,439, Cl. 294-110.100.

Hanna, Marie R.: *See—*
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,522,765, Cl. 260-463.000.

Hannappel, Gerald J. All terrain vehicle conversion system. 4,522,420, Cl. 280-289.00A.

Hanson, Harley M., to Merck & Co., Inc. Orexigenic use of α-fluoromethyl-histidine. 4,522,823, Cl. 514-400.000.

Hanson, John R.; Hauser, James L.; Kilfeather, James F., Jr.; and Hendriks, Hendrik B., to General Electric Company. Method for making multi-layer metal core circuit board laminate with a controlled thermal coefficient of expansion. 4,522,667, Cl. 156-87.000.

Hantke, Klaus: *See—*
Brajder, Antonio; and Hantke, Klaus, 4,523,268, Cl. 363-98.000.

Hanyu, Susumu; Takenoya, Hideaki; and Kato, Shinichi, to Janome Sewing Machine Co. Ltd. Pattern generating system of computer sewing machine. 4,522,134, Cl. 112-453.000.

Haq, Zia: *See—*
Barby, Donald; and Haq, Zia, 4,522,953, Cl. 521-64.000.

Hara, Masanori: *See—*
Takenoya, Hideaki; Fujimura, Toshiro; Hara, Masanori; and Tonomura, Yoshinobu, 4,522,137, Cl. 112-266.100.

Harada, Michiko. Portable small-sized washing machine. 4,522,045, Cl. 68-22.00A.

Harada, Takakiyo: *See—*
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,522,994, Cl. 526-351.000.

Haraguchi, Keisuke: *See—*
Kando, Toru; and Haraguchi, Keisuke, 4,522,478, Cl. 354-288.000.

Hardesty, Edwin C.; and Hutchins, Erle M., to AT&T Technologies, Inc. Systems for and methods of making electrical connections. 4,522,459, Cl. 339-98.000.

Harding A/S: *See—*
Klem, Per G., 4,522,144, Cl. 114-348.000.

Harigae, Shunji: *See—*
Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, 4,523,304, Cl. 369-32.000.

Harris, Eugene G.: *See—*
Fayter, Richard G., Jr.; and Harris, Eugene G., 4,522,749, Cl. 252-522.00R.

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Packer, Herbert, 4,522,865, Cl. 428-212.000.

Harte, J. Richard. Computer assisted instructional and testing apparatus with switch closure at two different depths. 4,522,599, Cl. 434-339.000.

Hartin, Sam S.: *See—*
Sulouff, Robert E.; Hartin, Sam S.; Cook, Koy B.; Kerns, David V., Jr.; Davidson, Jimmy L.; and Warren, Keith O., 4,522,072, Cl. 73-765.000.

Harting, Jurgen; and Fuchs, Andreas, to Merck Patent Gesellschaft mit Beschrankter Haftung. 1-(p-2-Isopropoxyethoxymethyl-phenoxy)-3-isopropylamino-propan-2-ol for decreasing the intra-ocular pressure and an ophthalmic preparation thereof. 4,522,829, Cl. 514-652.000.

Hartmann, Horst: *See*—
Horn, Dieter; Schmidt, Hans W.; Ditter, Walter; Hartmann, Horst; Lueddecke, Erik; and Schmieder, Klaus, 4,522,743, Cl. 252-311.000.

Harvey, Barry; and Barry, Robert C., to Advanced Micro Devices, Inc. PROM trimmed digital-to-analog converter. 4,523,182, Cl. 340-347.0DA.

Hasebe, Nobuhisa; Kawada, Hiroshi; Yokoyama, Naoki; and Komori, Shigeki, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for removing cutting burr sticking to lower surface of slab. 4,522,540, Cl. 409-293.000.

Hasegawa, Tsuneo, to Man Design Co., Ltd. Gloves for recovering the functions of the carpal joint, the hand and the fingers. 4,522,197, Cl. 128-26.000.

Hasegawa, Yoji; and Shinzawa, Motohiro, to Nissan Motor Company, Limited. Exhaust particle removal system for an internal combustion engine. 4,522,027, Cl. 60-274.000.

Hasegawa, Yoji; and Shinzawa, Motohiro, to Nissan Motor Company, Limited. Regenerative burner control apparatus. 4,522,028, Cl. 60-277.000.

Hashimoto, Hiromi: *See*—
Nakajima, Masahiro; and Hashimoto, Hiromi, 4,523,323, Cl. 375-37.000.

Hashizume, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Ignition circuit for an internal combustion engine. 4,522,186, Cl. 123-643.000.

Haslanger, Martin F.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,522,949, Cl. 514-469.000.

Hasunuma, Yoshifumi: *See*—
Endo, Keizo; Matsumura, Hiroshi; Hasunuma, Yoshifumi; Masai, Siro; and Oguma, Noboru, 4,522,237, Cl. 141-95.000.

Hatada, Koichi; Okamoto, Yoshio; and Kitayama, Tatsuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Copolymers, process for the preparation thereof and ionizing radiation sensitive resist using such copolymers. 4,523,000, Cl. 526-336.000.

Hatco Chemical Corporation: *See*—
Wan, K. Ming; Chen, Mary S.; and Pendse, Anil D., 4,523,026, Cl. 560-163.000.

Hatherley, Bruce E. Financial board game. 4,522,407, Cl. 273-256.000.

Hatley, Kenneth J.: *See*—
Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J., 4,522,882, Cl. 428-351.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. V-belt. 4,522,613, Cl. 474-245.000.

Hauser, Arnold: *See*—
Maurer, Bruno; and Hauser, Arnold, 4,522,748, Cl. 252-522.00R.

Hauser, James L.: *See*—
Hanson, John R.; Hauser, James L.; Kilfeather, James F., Jr.; and Hendriks, Hendrik B., 4,522,667, Cl. 156-87.000.

Haussmann, Wolfgang: *See*—
Luder, Rainer; and Haussmann, Wolfgang, 4,523,223, Cl. 358-27.000.

Hawrylo, Frank Z., to United States of America, Air Force. Simultaneous doped layers for semiconductor devices. 4,523,212, Cl. 357-17.000.

Hay, Noah D., to General Electric Company. Dry type transformer having improved ducting. 4,523,169, Cl. 336-60.000.

Hay, Noah D.: *See*—
Closson, James M.; and Hay, Noah D., 4,521,955, Cl. 29-605.000.
Rademaker, Leo C.; Hopkinson, Philip J.; Bell, Gordon M.; and Hay, Noah D., 4,521,954, Cl. 29-605.000.

Hayashi, Masahiro; Shimizu, Makoto; Kobayashi, Kazuo; and Sekiya, Teruo, to Hitachi, Ltd. Continuous rolling mill. 4,522,051, Cl. 72-235.000.

Hayashi, Mishio, to Takeda Riken Co., Ltd. Interval-expanding timer. 4,523,288, Cl. 364-569.000.

Hayashi, Nobutaka; and Komori, Yoshinori, to Sanyo Electric Co., Ltd. Video signal recording and reproducing apparatus, including means for discriminating the mode of multiplexing of an audio signal. 4,523,236, Cl. 358-341.000.

Hayashi, Ryuzo: *See*—
Suzuki, Toshitake; Hayashi, Ryuzo; Arai, Naoto; and Oeda, Yoshitaka, 4,523,205, Cl. 346-208.000.

Hayes, Robert L.: *See*—
Thomas, Samuel J.; Robich, James M.; and Hayes, Robert L., 4,523,141, Cl. 324-54.000.

Haynes, James R.: *See*—
Stevens, James C.; and Haynes, James R., 4,523,058, Cl. 179-84.00T.

Hayward, C. Michael. Matrix board. 4,522,449, Cl. 361-407.000.

Healy, Jerry V., Jr., to Westinghouse Electric Corp. Replaceable intermediate socket and plug connector for a solid-state data transfer system. 4,523,296, Cl. 364-900.000.

Heck, Ronald M.: *See*—
Hwang, Herng-Shinn; Heck, Ronald M.; and Yarrington, Robert M., 4,522,894, Cl. 429-17.000.

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Gelse, Hans-Dieter; Heger, Werner; and Kramer, Manfred, 4,522,568, Cl. 417-307.000.

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Herb, Armin: *See*—
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Lukach, Carl; Majewicz, Thomas G.; and Reid, Albert R., 4,523,010, Cl. 536-91.000.

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Hewitt, Mary J.; and Morse, Arthur L., to Hughes Aircraft Company. Low noise charge coupled imager circuit. 4,523,326, Cl. 377-58.000.

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Hiatt, David M., to Esco Corporation. Sprocket assembly with replaceable teeth. 4,522,611, Cl. 474-162.000.
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Hiers, John J., to Lydall, Inc. Integral textile composite fabric. 4,522,876, Cl. 428-285.000.
Higgins, Kenneth B., to Milliken Research Corporation. Carpet tile with stabilizing material embedded in adhesive layer. 4,522,857, Cl. 428-95.000.
Higgins, Theodore E.: *See—*
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Hildebolt, William M., to Campbell Soup Company. Phased aseptic sterilization and packaging process and system. 4,522,015, Cl. 53-425.000.
Hill, H. Wayne, Jr.; and Reed, Jerry O., to Phillips Petroleum Company. Biaxially oriented polyamide film. 4,522,867, Cl. 428-220.000.
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Hochel, Robert C.; and Saturday, Kathy A., to United States of America, Energy. Fluorination process using catalyst. 4,522,794, Cl. 423-251.000.
Hochgesand, Gerhard; Kahles, Heinz; Wiesner, Paul; and Stonner, Hans-Martin, to Metallgesellschaft Aktiengesellschaft. Process for the treatment of an aqueous condensate. 4,522,730, Cl. 210-750.000.
Hochreuther, Karl; and Tragatschnig, Jorg, to Metrawatt GmbH. Portable measuring device. 4,522,061, Cl. 73-431.000.
Hochstatter, Brian R., to Emerson Electric Co. Linear slide. 4,522,454, Cl. 308-3.00R.
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Klein, Joachim; Widdecke, Hartmut; Doscher, Frank; and Pohl, Fritz, 4,522,952, Cl. 521-31.000.
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Hoek, Arend; Minderhoud, Johannes K.; and Post, Martin F. M., to Shell Oil Company. Process for preparing a catalyst. 4,522,938, Cl. 502-307.000.
Hoen, Cuyler; and Pufpaff, Frederick J., to Simmons Fastener Corporation. Spring-loaded toggle latch. 4,522,436, Cl. 292-113.000.
Hoffmann, Armin; and Herb, Armin, to Hilti Aktiengesellschaft. Container for plastic substances. 4,522,316, Cl. 222-327.000.
Hogan, John P.; Hsieh, Eric T.; and Randall, James C. Low density polyethylene. 4,522,987, Cl. 526-106.000.
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Hohl, G. Burnell; and Gasiunas, Donatas V., to Pitney Bowes Inc. Voice/text storage and retrieval system. 4,523,055, Cl. 179-2.0DP.
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Holzer, Helmut, to Carl Freudenberg, Firma. Shaft seal. 4,522,328, Cl. 277-47.000.
Holzer, Helmut, to Carl Freudenberg, Firma. Axle or shaft seal with overlapping ring extension members. 4,522,410, Cl. 277-56.000.
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Hooper, Bernard. Stepped piston and stepped piston engine. 4,522,163, Cl. 123-73.00F.

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Horii, Kenichi: *See—*
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Horn, Dieter; Schmidt, Hans W.; Ditter, Walter; Hartmann, Horst; Lueddecke, Erik; and Schmieder, Klaus, to BASF Aktiengesellschaft. Preparation of finely divided pulverulent carotinoid and retinoid compositions. 4,522,743, Cl. 252-311.000.

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Houdart, Michel; Arruberrenal, Edouard; and Maurette, Frederic, to Thomson-CSF. Wideband microwave device generating even harmonics of an incident signal. 4,523,163, Cl. 333-218.000.

Houghton, Royal E.; and Walasewicz, Stanley J. Gimbal-mounted dressing device for grinding machine. 4,522,188, Cl. 125-11.0CC.

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Howell, George B., III. Vase locking device. 4,522,366, Cl. 248-551.000.

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Huth, Joseph F., III, to Spang & Company. Adjustable air gap ferrite structures and methods of manufacture. 4,523,170, Cl. 336-83.000.

Hutson, James H. Hydraulic fed log debarker. 4,522,242, Cl. 144-208.00E.

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Hyink, Roy: *See—*
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Kuck, David L., 4,522,537, Cl. 405-288.000.

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Ichinohe, Eisuke: *See—*
Kadota, Hiroshi; and Ichinohe, Eisuke, 4,523,301, Cl. 365-49.000.

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Tazaki, Saburo; and Ide, Akifumi, 4,523,181, Cl. 340-347.0DD.

Ide, Jushi: *See—*
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IE PE GE B.V.: *See—*
Van Gils, Antonius C. M., 4,522,036, Cl. 62-157.000.

Igashira, Toshihiko: *See—*
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Iijima, Chiyoaki, to Epson Corporation. Liquid crystal composition and display device. 4,522,470, Cl. 350-350.00R.

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Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,523,011, Cl. 544-238.000.

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Ikin, John B., to Ciba Geigy AG. Web scanning apparatus. 4,522,497, Cl. 356-431.000.

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Volkers, Jack C.; and Conley, William R., 4,522,890, Cl. 428-624.000.
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Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, to General Research of Electronics, Inc. Antenna with BNC-type coaxial connector. 4,523,197, Cl. 343-702.000.
Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte: *See*—
Linnau, Yendra; and Schwarz, Otto, 4,522,751, Cl. 260-112.00B.
Imperial Chemical Industries PLC: *See*—
Brittain, David R.; and Wood, Robin, 4,523,021, Cl. 548-410.000.
Brody, Harry, 4,522,884, Cl. 428-400.000.
Corfield, Brian L.; and Rowe, Raymond C., 4,522,840, Cl. 427-3.000.
Scott, Norman; and Hepworth, Paul, 4,523,038, Cl. 568-492.000.
Worthington, Paul A., 4,523,019, Cl. 548-262.000.
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Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, 4,523,281, Cl. 364-424.100.
Inamori, Mikio: *See*—
Takenoya, Hideaki; and Inamori, Mikio, 4,522,138, Cl. 112-266.100.
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Girard, Thomas L.; and Lewis, Monty D., 4,522,396, Cl. 273-58.00K.
Ingalls, Marjorie D.; and Ingalls, Richard D. Method for reproducing one or more target colors on photographic paper or the like. 4,522,491, Cl. 355-77.000.
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Ingalls, Marjorie D.; and Ingalls, Richard D., 4,522,491, Cl. 355-77.000.
Ingebrigtsen, Janis: *See*—
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,522,799, Cl. 423-306.000.
Ingersoll-Rand Company: *See*—
Aumick, James M., 4,521,949, Cl. 29-446.000.
Inhofer, John D.: *See*—
Speers, Leonard E.; Inhofer, John D.; and Redenbarger, Philip D., 4,522,160, Cl. 123-41.490.
Inmont Corporation: *See*—
Chisvette, Dominick; Lattimore, James; and Sova, Stanley G., 4,522,654, Cl. 106-288.00Q.
Inohara, Shizuo: *See*—
Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; Yamamoto, Keisuke; and Yasumoto, Yoshio, 4,523,225, Cl. 358-56.000.
Inoue, Hidenori: *See*—
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Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, to Chisso Corporation. Trans-4-alkyloxymethyl-1-(4'-substituted biphenylyl-4)cyclohexanes. 4,522,741, Cl. 252-299.630.
Inoue, Kenichi: *See*—
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Inoue, Mitsuru: *See*—
Musumiya, Raita; Sano, Hideo; Izichi, Yasuto; Inoue, Mitsuru; and Izawa, Kenzyu, 4,522,082, Cl. 74-512.000.
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Insouth Microsystems, Inc.: *See*—
Sulouff, Robert E.; Hartin, Sam S.; Cook, Koy B.; Kerns, David V., Jr.; Davidson, Jimmy L.; and Warren, Keith O., 4,522,072, Cl. 73-765.000.
Institut Francais du Petrole: *See*—
Cretin, Jacques; and Beauducel, Claude, 4,523,191, Cl. 340-825.520.
Martin, Madeleine; Lesage, Jean; Courbin, Gerard; and Rivereau, Alain, 4,522,878, Cl. 428-313.700.
Institut Pasteur: *See*—
Adamowicz, Philippe; and Muller, Ludwig, 4,522,809, Cl. 424-89.000.
INTERATOM Internationale Atomreaktorbau GmbH: *See*—
Knaak, Joachim, 4,522,073, Cl. 73-861.120.
International Business Machines Corporation: *See*—
Abbiate, Jean-Claude, 4,523,322, Cl. 375-36.000.
Bohlen, Harald; Kaus, Gerhard; Greschner, Johann; Keyser, Joachim H.; and Kulcke, Werner, 4,522,893, Cl. 428-641.000.
Clark, Gary A.; Johnson, Frederick W.; and Queener, Carl A., 4,522,486, Cl. 355-14.0SH.
Clecak, Nicholas J.; McKean, Dennis R.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., 4,522,911, Cl. 430-192.000.
Riseman, Jacob, 4,521,952, Cl. 29-590.000.
International Computers Limited: *See*—
Burton, Christopher P.; and Johnson, Kenneth C., 4,523,192, Cl. 340-825.570.
International Flavors & Fragrances Inc.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,522,765, Cl. 260-463.000.
International Key Marketing Incorporated: *See*—
Kasprzycki, Robert; and Fudge, Chester, 4,521,981, Cl. 40-2.00A.
International Minerals & Chemical Corp.: *See*—
Seeney, Charles E.; and Kraemer, John F., 4,522,651, Cl. 106-38.300.
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,522,799, Cl. 423-306.000.
International Paper Company: *See*—
Feldmann, Herman F., 4,522,685, Cl. 162-30.110.
International Rice Research Institute, Republic of the Philippines: *See*—
Buttery, Ronald G.; Ling, Louisa C.; and Juliano, Bienvenido O., 4,522,838, Cl. 426-537.000.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Eynon, David L.; Kingsnorth, Stanley W.; and Varma, Mani K., 4,522,687, Cl. 162-336.000.
Interpace Corporation: *See*—
Baker, Anthony C.; and Pinkham, Thomas A., 4,523,054, Cl. 174-45.00R.
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Iowa State University Research Foundation, Inc.: *See*—
Walters, Rodney R., 4,522,715, Cl. 210-198.200.
IPCO Corporation: *See*—
Braun, Frank D.; Witt, Walter; and Putra, Stanislav, 4,522,591, Cl. 433-60.000.
Ireks Arkady GmbH, Firma: *See*—
Menzel, Waldemar, 4,522,041, Cl. 62-342.000.
Isanta, Alberto P.: *See*—
Llauge, Joaquin R.; and Isanta, Alberto P., 4,522,225, Cl. 137-351.000.
ISCO, Inc.: *See*—
Allington, Robert W., 4,523,097, Cl. 250-458.100.
Iseard, Barry S., to Anglo-American Research Ltd. Automatic watering system for batteries and fuel cells. 4,522,896, Cl. 429-63.000.
Ishida, Kohji; Numata, Tatsuo; and Sakamoto, Masaharu, to Pioneer Electronic Corporation. FM receiver. 4,523,329, Cl. 381-3.000.
Ishida, Masahiko; and Haga, Ryoichi, to Agency of Industrial Science and Technology, The. Treating process of organic wastes. 4,522,721, Cl. 210-603.000.
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Ochiai, Hideo; Nagoya, Yoshinari; Fujimoto, Ryoichi; Yamazaki, Susumu; Sasamoto, Nobuhiko; and Ishida, Shinichi, 4,522,040, Cl. 62-419.000.
Ishiguri, Yukio: *See*—
Kohsaka, Hideo; Sasaki, Mitsuru; and Ishiguri, Yukio, 4,522,817, Cl. 514-95.000.
Kohsaka, Hideo; Mitsuru, Sasaki; and Ishiguri, Yukio, 4,522,942, Cl. 514-95.000.
Ishii, Hiroshi, to Casio Computer Co., Ltd. Electronic musical instrument for reading out and performing musical tone data previously stored. 4,522,100, Cl. 84-1.030.
Ishii, Hiroshi: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,522,507, Cl. 368-157.000.
Ishii, Toshio: *See*—
Amano, Matsuo; Sakamoto, Shinichi; Miki, Masayuki; Sasayama, Takao; Suda, Seiji; Mouri, Yasunori; and Ishii, Toshio, 4,523,284, Cl. 364-431.120.
Itagaki, Takuo: *See*—
Niiho, Masaaki; and Itagaki, Takuo, 4,523,108, Cl. 307-353.000.
Ito, Hiroshi: *See*—
Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, 4,523,281, Cl. 364-424.100.
Ito, Tomoo: *See*—
Kamifuji, Hiroshi; Ito, Tomoo; and Niida, Chiaki, 4,522,175, Cl. 123-339.000.
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, to Clarion Co., Ltd. Head shift mechanism in a magnetic tape apparatus. 4,523,241, Cl. 360-105.000.
Itoh, Isamu: *See*—
Ichijima, Seiji; Mihayashi, Keiji; and Itoh, Isamu, 4,522,917, Cl. 430-564.000.
Itoh, Yasuhiro, to Iwatsu Electric Co., Ltd. Variable gain amplifier. 4,523,153, Cl. 330-254.000.
ITT Industries, Inc.: *See*—
Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, 4,523,222, Cl. 358-27.000.
ITW Espana S.A.: *See*—
Llauge, Joaquin R.; and Isanta, Alberto P., 4,522,225, Cl. 137-351.000.
Ive, Frank. Method for producing a low density foamed polyester resin. 4,522,954, Cl. 521-78.000.
Iwai, Hiroshi: *See*—
Konaka, Masami; Iwai, Hiroshi; and Nishi, Yoshio, 4,523,213, Cl. 357-23.700.

Iwaki, Akio; Suzuki, Norihito; Yamamoto, Takeshi; and Aoki, Toru, to Konishiroku Photo Industry Co., Ltd. Support for lithographic printing plate. 4,522,891, Cl. 428-626.000.

Iwasa, Koji: *See—*
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,522,691, Cl. 204-18.100.

Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Soma, Masafumi; and Kohno, Yoshihiko, 4,523,289, Cl. 364-569.000.

Iwasaki, Yasuhisa: *See—*
Kumagae, Yojiro; and Iwasaki, Yasuhisa, 4,523,018, Cl. 546-315.000.

Iwasawa, Teruo, to Olympus Optical Co., Ltd. Tape recorder having an alarm and stop mechanism for end-of-tape conditions. 4,523,239, Cl. 360-74.100.

Iwashita, Tomonori; and Fukahori, Hidehiko, to Canon Kabushiki Kaisha. Electric motor drive device for camera. 4,522,477, Cl. 354-173.100.

Iwatani, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,523,215, Cl. 357-40.000.

Iwatsu Electric Co., Ltd.: *See—*
Itoh, Yasuhiro, 4,523,153, Cl. 330-254.000.

Iyehara, Sadahiro: *See—*
Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; Yamamoto, Keisuke; and Yasumoto, Yoshio, 4,523,225, Cl. 358-56.000.

Izawa, Kenzyu: *See—*
Musumiya, Raita; Sano, Hideo; Izichi, Yasuto; Inoue, Mitsuru; and Izawa, Kenzyu, 4,522,082, Cl. 74-512.000.

Izichi, Yasuto: *See—*
Musumiya, Raita; Sano, Hideo; Izichi, Yasuto; Inoue, Mitsuru; and Izawa, Kenzyu, 4,522,082, Cl. 74-512.000.

Izu, Masatsugu: *See—*
Ovshinsky, Stanford R.; and Izu, Masatsugu, 4,522,663, Cl. 148-403.000.

Izumiyama, Hiroo: *See—*
Koizumi, Hajime; Ohara, Shumpei; Kouda, Kiyoshi; Nagatomo, Muneshige; Sagara, Noriyasu; Togari, Satoshi; and Izumiyama, Hiroo, 4,522,254, Cl. 165-34.000.

J. D. Phillips Corporation: *See—*
Phillips, James D., 4,522,189, Cl. 125-11.0TP.

J. I. Case Company: *See—*
Marchi, Gary C.; and Logan, Richard H., 4,522,109, Cl. 91-420.000.
Speers, Leonard E.; Inhofer, John D.; and Redenbarger, Philip D., 4,522,160, Cl. 123-41.490.

J-M Manufacturing Co., Inc.: *See—*
Martin, William W., Jr.; and French, David W., 4,522,578, Cl. 425-110.000.

J. Mulcahy Enterprises Incorporated: *See—*
Mulcahy, Joseph A., 4,522,249, Cl. 164-466.000.

J-O Wallen Electronic Int. AB: *See—*
Wallen, Jan O., 4,523,252, Cl. 361-212.000.

J. T. Baker Chemical Company: *See—*
Ramsden, Hugh E., 4,522,724, Cl. 210-635.000.

Jabarin, Saleh A., to Owens-Illinois, Inc. Method for production of poly(ethylene terephthalate) articles. 4,522,779, Cl. 264-530.000.

Jackson, Melvin R.: *See—*
Gigliotti, Michael F. X., Jr.; Yang, Swe-Wong; Jackson, Melvin R.; Bruch, Charles A.; and Nguyen-Dinh, Xuan, 4,522,664, Cl. 148-404.000.

Jacobsen, Stephen C.; Knutti, David F.; and Johnson, R. Todd, to University of Utah. Electrically driven artificial arm. 4,521,924, Cl. 3-1.100.

Jacobsson, Kenth, to Tetra Pak Developpement SA. Opening arrangement for packing containers with pressurized contents. 4,522,305, Cl. 206-632.000.

Jacobsson, Rolf A.: *See—*
Adman, Nils G.; and Jacobsson, Rolf A., 4,522,269, Cl. 173-12.000.

Jacquet, Bernard; Lang, Gerard; and Malaval, Alain, to Societe Anonyme dite: L'Oreal. Anti-sunburn compositions containing 2-phenyl-indole derivatives. 4,522,808, Cl. 424-59.000.

Jaeger, Knut, to ESS GmbH Skibindungen. Ski binding. 4,522,422, Cl. 280-617.000.

Jaegers, Leopold. Transporter for heavy loads. 4,522,297, Cl. 198-774.000.

Jagoe, A. Louis, III. Means for chilling cardioplegic solutions. 4,522,640, Cl. 62-4.000.

Janoff, Andrew S.: *See—*
Lenk, Robert P.; Fountain, Michael W.; Janoff, Andrew S.; Ostro, Marc J.; and Popescu, Micrea C., 4,522,803, Cl. 424-1.100.

Janome Sewing Machine Co. Ltd.: *See—*
Hanyu, Susumu; Takenoya, Hideaki; and Kato, Shinichi, 4,522,134, Cl. 112-453.000.
Takenoya, Hideaki; Fujimura, Toshiro; Hara, Masanori; and Tonomura, Yoshinobu, 4,522,137, Cl. 112-266.100.
Takenoya, Hideaki; and Mishima, Fumiyuki, 4,522,520, Cl. 400-636.100.

Janome Sewing Machine Industry Co., Ltd.: *See—*
Koide, Akio, 4,522,140, Cl. 112-279.000.
Takenoya, Hideaki; and Inamori, Mikio, 4,522,138, Cl. 112-266.100.

Janssen Pharmaceutica N.V.: *See—*
Vandenberk, Jan; Kennis, Ludo; Van der Aa, Marcel; and Van Heertum, Albert, 4,522,945, Cl. 514-259.000.

Japan Electronic Materials Corp.: *See—*
Okubo, Masao; and Yoshimitsu, Yasuro, 4,523,144, Cl. 324-158.00P.

Jeffery, James E.; Kozlik, Antonin; and Wilmshurst, Eric C., to Boots Company plc, The. Therapeutic agents. 4,522,828, Cl. 514-646.000.

Jenck, Jean, to Rhone-Poulenc Chimie de Base. Recovery of palladium values from carbonylation reaction medium. 4,522,760, Cl. 260-410.90R.

Jenneman, Gary E.: *See—*
McInerney, Michael J.; Jenneman, Gary E.; Knapp, Roy M.; and Menzie, Donald E., 4,522,261, Cl. 166-246.000.

Jennings, Kenneth L.: *See—*
Jennings, Paul D.; and Jennings, Kenneth L., 4,522,313, Cl. 221-1.000.

Jennings, Paul D.; and Jennings, Kenneth L. Article dispenser. 4,522,313, Cl. 221-1.000.

Jensen, Jack E., to CVI Incorporated. Cryogenic refrigerator with gas spring loaded valve. 4,522,033, Cl. 62-6.000.

Jerberyd, Leif, to Nitro Nobel AB. Device for charging drillholes. 4,522,129, Cl. 104-138.00G.

Jespersen, Paul W., to Georgia-Pacific Corporation. Method and apparatus for dispensing web material from split core rolls. 4,522,346, Cl. 242-55.300.

Jester, James M. Water bed sheet anchoring apparatus. 4,521,970, Cl. 33-180.00R.

Jibu, Mitsuo, to Sharp Kabushiki Kaisha. Solar powered circuit having CMOS and bipolar transistors. 4,523,217, Cl. 357-43.000.

Johann Nicolaas Raubenheimer: *See—*
Raubenheimer, Johann N., 4,521,933, Cl. 15-1.700.

Johannes Heidenhain GmbH: *See—*
Bayer, Erich; Beckerbauer, Anton; Flatscher, Georg; and Ullrich, Martin, 4,522,862, Cl. 428-195.000.

Johl, Armin, to Karl Seeger Lederwarenfabrik GmbH. Document case. 4,522,047, Cl. 70-69.000.

Johnson, Arlen K., to AT&T Bell Laboratories. Microwave circuit device and method for fabrication. 4,523,162, Cl. 333-202.000.

Johnson, Edward J.; and Koble, Robert L., Jr., to Phoenix Manufacturing, Inc. Blower wheel apparatus. 4,522,558, Cl. 416-187.000.

Johnson, Frederick W.: *See—*
Clark, Gary A.; Johnson, Frederick W.; and Queener, Carl A., 4,522,486, Cl. 355-14.0SH.

Johnson, Kenneth C.: *See—*
Burton, Christopher P.; and Johnson, Kenneth C., 4,523,192, Cl. 340-825.570.

Johnson, Mark G., to Mostek Corporation. MOSFET sense amplifier circuit. 4,523,110, Cl. 307-530.000.

Johnson, Martin Reid: *See—*
Kallman, William R., 4,523,113, Cl. 310-11.000.

Johnson, R. Todd: *See—*
Jacobsen, Stephen C.; Knutti, David F.; and Johnson, R. Todd, 4,521,924, Cl. 3-1.100.

Johnson, Richard H. Modular electrified cover plate. 4,522,455, Cl. 339-14.00R.

Johnson, Robert W.: *See—*
Keel, Beat G.; and Johnson, Robert W., 4,523,238, Cl. 360-46.000.

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Robinson, Delmar W.; Johnson, Russell W.; and Moser, Mark D., 4,522,935, Cl. 502-223.000.

Johnson, W. Grant. Valve structure for an oral evacuator system. 4,522,592, Cl. 433-95.000.

Johnson, William C.: *See—*
Bailen, Eddie H.; Rasmussen, David H.; and Johnson, William C., 4,522,615, Cl. 493-37.000.

Johnston, Charles R.; and Green, Gregory M., to Container Products Corp. Vacuum spray head. 4,521,935, Cl. 15-322.000.

Johnston, Howard; and Troxell, Lillian H., to Dow Chemical Company, The. Preparation of trifluoromethyl pyridinyloxyphenoxy propanoic acids and propanols and derivatives thereof. 4,523,017, Cl. 546-302.000.

Jonas, Jules: *See—*
Lair, Clair K.; Jonas, Jules; and Anderson, Keith D., 4,522,356, Cl. 244-3.150.

Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; and Withers, Howard P., to Atlantic Richfield Company. Methane conversion process. 4,523,049, Cl. 585-500.000.

Jones, C. Andrew; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion process. 4,523,050, Cl. 585-500.000.

Jones, C. David: *See—*
Ward, John S.; and Jones, C. David, 4,522,758, Cl. 260-397.500.

Jones, Howard: *See—*
Loev, Bernard; Jones, Howard; and Chan, Wan-kit, 4,523,042, Cl. 568-824.000.

Jones, James E.: *See—*
Das, Suryya K.; Boberski, William G.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,522,958, Cl. 523-212.000.

Jones, Peter H.: *See—*
Moormann, Alan E.; Pitzele, Barnett S.; and Jones, Peter H., 4,523,020, Cl. 548-353.000.

Jonnes, Nelson, to American Polywater Corporation. Substantially neutral aqueous lubricant. 4,522,733, Cl. 252-49.300.

Joppig, Peter: *See—*
Frankle, Gerhard; and Joppig, Peter, 4,522,164, Cl. 123-180.00R.

Jordan, Bobby R.: *See—*
Casstevens, Arvil; Coble, William H.; Shields, Harper; Ferrell, Roscoe M.; and Jordan, Bobby R., 4,522,042, Cl. 66-140.00S.

Jordan, Richard M.: *See—*
Enright, Philip G.; Hughes, Ian R.; and Jordan, Richard M., 4,522,784, Cl. 420-590.000.

Jorgensen, Jorgen A.; and Nygren, Donald W., to Northland Aluminum Products, Inc. Low profile food rotator. 4,523,070, Cl. 219-10.55F.

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Jotwani, Haresh C.: *See*—
Bull, John; Croft. Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.

Joyner, Robert G., to Dana Corporation. Flange yoke. 4,522,608, Cl. 464-134.000.

Juliano, Bienvenido O.: *See*—
Buttery, Ronald G.; Ling, Louisa C.; and Juliano, Bienvenido O., 4,522,838, Cl. 426-537.000.

Justus, Jimmie J., to United States of America, Air Force. Three-stage binary coincidence detector apparatus with adaptive constant false alarm rate. 4,523,325, Cl. 377-44.000.

K. S. Macey Machine Company, Inc.: *See*—
Macey, Keith S., 4,522,383, Cl. 270-53.000.

Kabushiki Kaisha Imamura Seisakusho: *See*—
Shimokawa, Hiroshi, 4,522,076, Cl. 73-863.410.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Konishi, Satoshi; and Sashiki, Takashi, 4,522,274, Cl. 177-25.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tamura, Yukio; Kaminishi, Masashi; and Kato, Yutaka, 4,522,451, Cl. 305-18.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,522,507, Cl. 368-157.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,522,567, Cl. 417-270.000.

Kabushiki Kaisha Universal: *See*—
Nishikawa, Ikuo, 4,522,399, Cl. 273-143.00R.

K.K. Toyota Chuo Kenkyusho: *See*—
Oshima, Yujiro; and Aoyama, Taro, 4,522,172, Cl. 123-276.000.

Kadota, Hiroshi; and Ichinohe, Eisuke, to Matsushita Electric Industrial Co., Ltd. Associative memory. 4,523,301, Cl. 365-49.000.

Kahles, Heinz: *See*—
Hochgesand, Gerhard; Kahles, Heinz; Wiesner, Paul; and Stonner, Hans-Martin, 4,522,730, Cl. 210-750.000.

Kaji, Haruo: *See*—
Inoue, Toshitsugu; Nakada, Akiyoshi; Kaji, Haruo; Doi, Makoto; and Takezawa, Kuninori, 4,522,555, Cl. 414-733.000.

Kaji, Hisatsugu: *See*—
Shigeta, Masatomo; Fukuda, Hiroyuki; Saitoh, Kuniyuki; and Kaji, Hisatsugu, 4,522,895, Cl. 429-44.000.

Kajima Corporation: *See*—
Akihama, Shigeyuki; Koizumi, Hajime; Umeki, Yoshihiko; Saito, Makoto; Banno, Tadashi; and Tateno, Shinya, 4,522,003, Cl. 52-391.000.

Kajima Kensetsu Kabuhiki Kaisha: *See*—
Koizumi, Hajime; Ohara, Shumpei; Kouda, Kiyoshi; Nagatomo, Muneshige; Sagara, Noriyasu; Togari, Satoshi; and Izumiyama, Hiroo, 4,522,254, Cl. 165-34.000.

Kajiwara, Akiharu: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Kajiwara, Akiharu; and Ota, Kiichiro, 4,522,759, Cl. 260-404.000.

Kake, Nin: *See*—
Kinoshita, Hisashi; Yoshitake, Hideki; and Kake, Nin, 4,523,134, Cl. 318-313.000.

Kaler, Ward S.: *See*—
O'Brien, Larry S.; and Kaler, Ward S., 4,522,787, Cl. 422-78.000.

Kallestad, Daniel R.; Kress, Bruce A.; and Satre, Kenneth I., to Sentry Technologies, Inc. Method and apparatus for aeration of stored grain. 4,522,335, Cl. 236-44.00C.

Kallman, William R., to Johnson, Martin Reid, a part interest. Magnetohydrodynamic generator system. 4,523,113, Cl. 310-11.000.

Kalowski, Thaddeus J.: *See*—
Weimer, Ralph E.; Kalowski, Thaddeus J.; and Novy, Robert A., 4,522,117, Cl. 99-348.000.

Kamamori, Hitoshi: *See*—
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,522,691, Cl. 204-18.100.

Kameda, Osamu; and Fuse, Takahiro, to Casio Computer Co., Ltd. Video signal analog-to-digital converter for an image display apparatus. 4,523,232, Cl. 358-236.000.

Kamifuji, Hiroshi; Ito, Tomoo; and Niida, Chiaki, to Hitachi, Ltd. Rotational speed control apparatus for internal combustion engines. 4,522,175, Cl. 123-339.000.

Kaminishi, Masashi: *See*—
Tamura, Yukio; Kaminishi, Masashi; and Kato, Yutaka, 4,522,451, Cl. 305-18.000.

Kamins, Theodore I.: *See*—
Bradbury, Donald R.; Tsao, Chi-Wing; and Kamins, Theodore I., 4,522,662, Cl. 148-175.000.

Kamiya, Joji: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,523,011, Cl. 544-238.000.

Kamiya, Osamu; and Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Copying machine including a dielectric covered metal reflective device. 4,522,485, Cl. 355-11.000.

Kanazawa, Hirotaka, to Mazda Motor Corporation. Steering device for a vehicle. 4,522,279, Cl. 180-143.000.

Kanbe, Junichiro: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,522,905, Cl. 430-60.000.

Kandell, Ronald J.: *See*—
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.

Kando, Toru; and Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Cover-equipped camera. 4,522,478, Cl. 354-288.000.

Kane, Garold L. Variable lobe cam mechanism. 4,522,085, Cl. 74-568.00R.

Kaneda, Shouzou: *See*—
Kawai, Toshikazu; Suzuki, Haruo; and Kaneda, Shouzou, 4,523,041, Cl. 568-755.000.

Kaneda, Tokuya: *See*—
Maeda, Takeshi; Mizoguchi, Yasumitsu; Takasago, Masahiro; Kaneda, Tokuya; and Tsunoda, Yoshito, 4,523,089, Cl. 250-205.000.

Kaneko, Tadashi: *See*—
Nishimura, Hirofumi; Oda, Hiroyuki; Kaneko, Tadashi; Takai, Akira; and Takeuchi, Nobuo, 4,522,179, Cl. 123-481.000.

Kang, Jung W.; and Hall, James E., to Firestone Tire & Rubber Company, The. Method of preparing high cis-1,4 diene polymers having good green strength and tack. 4,522,988, Cl. 526-133.000.

Kang, Jung W., to Firestone Tire & Rubber Company, The. Method of preparing high cis-1,4 diene polymers having good green strength and tack using a catalyst composition containing a carboxylated metal oxy aluminate component. 4,522,989, Cl. 526-133.000.

Kanmoto, Yoshiaki, to Ricoh Company, Ltd. Shading correction device. 4,523,229, Cl. 358-163.000.

Kanno, Tatsuya; and Toga, Yuzo, to Daicel Chemical Industries, Ltd. Monoacrylate or diacrylate of 2-methyl-propylene glycol and photosensitive composition containing the diacrylate. 4,522,913, Cl. 430-285.000.

Kano, Tokio: *See*—
Tamagawa, Akira; and Kano, Tokio, 4,522,493, Cl. 356-36.000.

Kanzaka, Yoshihiro, to Nippon Notion Kogyo Co., Ltd. Fastening for a garment. 4,521,943, Cl. 24-689.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Suzuki, Toshitake; Hayashi, Ryuzo; Arai, Naoto; and Oeda, Yoshitaka, 4,523,205, Cl. 346-208.000.

Kaplan, Carl, to Plough, Inc. Substantive topical compositions. 4,522,807, Cl. 424-59.000.

Kapral, Christopher W., to GTE Automatic Electric Laboratories, Incorporated. Integratable D/A converter. 4,523,179, Cl. 340-347.0DA.

Karch, John A.: *See*—
Yoo, Jin S.; Karch, John A.; Poss, Richard F.; and Burk, Emmett H., Jr., 4,522,937, Cl. 502-302.000.

Karl Seeger Lederwarenfabrik GmbH: *See*—
Johl, Armin, 4,522,047, Cl. 70-69.000.

Karlsson, Thomas, to Lidkopings Mekaniska Verkstads AB. Method and apparatus for determining the position of the center of a circular object. 4,521,966, Cl. 33-1.00M.

Karwat, Heinz, to Linde AG. Method and apparatus for regulating the NH_3 content in scrubbing liquid used in a gas scrubbing process. 4,522,638, Cl. 55-37.000.

Kasai, Masaji: *See*—
Koguchi, Toshiro; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Okachi, Ryo; and Nakayama, Kiyoshi, 4,522,812, Cl. 514-7.000.

Kase, Hiroshi; Matsumoto, Yoshiaki; and Ohkawa, Kouji, to O-M Limited. Automatic tool change machine tool. 4,521,950, Cl. 29-568.000.

Kase, Hiroshi: *See*—
Koguchi, Toshiro; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Okachi, Ryo; and Nakayama, Kiyoshi, 4,522,812, Cl. 514-7.000.

Kasegawa, Norimichi: *See*—
Kitagawa, Junji; Akita, Shigeyuki; Kasegawa, Norimichi; and Nakamura, Akira, 4,522,278, Cl. 180-79.100.

Kashima, Masao; and Tomuro, Noboru, to Mitsubishi Mining; and Cement Company Ltd. Dielectric ceramic composition. 4,522,927, Cl. 501-139.000.

Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. FM-receiver including a frequency-locked loop. 4,523,328, Cl. 381-3.000.

Kasprzycki, Robert; and Fudge, Chester, to International Key Marketing Incorporated. Key holder. 4,521,981, Cl. 40-2.00A.

Kassahun, Bahiru; and Viriyayuthakorn, Montri, to AT&T Technologies, Inc. Apparatus for coating lightguide fiber. 4,522,148, Cl. 118-405.000.

Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, to Mitsui Toatsu Kagaku Kabushiki Kaisha. Process for preparing

6-(substituted phenyl)-4,5-dihydro-3(2H)-pyridazinone compounds. 4,523,011, Cl. 544-238.000.

Kataoka, Masao: *See*—
Ohuchi, Shigehiro; and Kataoka, Masao, 4,522,868, Cl. 428-224.000.

Kato Hatsujo Kaisha Ltd.: *See*—
Ohkata, Ichizo, 4,522,219, Cl. 137-62.000.

Kato, Kazuo: *See*—
Kuboki, Shigeo; and Kato, Kazuo, 4,523,180, Cl. 340-347.0AD.

Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate compressor. 4,522,567, Cl. 417-270.000.

Kato, Shinichi: *See*—
Hanyu, Susumu; Takenoya, Hideaki; and Kato, Shinichi, 4,522,134, Cl. 112-453.000.

Kato, Yoshihisa, to Sumitomo Metal Mining Company, Ltd. Lead frame for integrated circuits and method of fabricating the same. 4,523,218, Cl. 357-70.000.

Kato, Yutaka: *See*—
Tamura, Yukio; Kaminishi, Masashi; and Kato, Yutaka, 4,522,451, Cl. 305-18.000.

Katsuki, Kosuke; Nishioka, Youiti; and Nomura, Susumu, to Toray Industries, Inc. Method for threading filaments on rollers of oxidizing furnace and apparatus therefor. 4,521,931, Cl. 8-149.200.

Kauffman, Jim W.; and Laughlin, William C., to Kerr-McGee Corporation. Process for the removal and recovery of heavy metals from aqueous solutions. 4,522,723, Cl. 210-611.000.

Kaus, Gerhard: *See*—
Bohlen, Harald; Kaus, Gerhard; Greschner, Johann; Keyser, Joachim H.; and Kulcke, Werner, 4,522,893, Cl. 428-641.000.

Kawabata, Takashi; Shinoda, Nobuhiko; and Sakai, Shinji, to Canon Kabushiki Kaisha. Battery voltage checking device for cameras. 4,522,480, Cl. 354-468.000.

Kawada, Hiroshi: *See*—
Hasebe, Nobuhisa; Kawada, Hiroshi; Yokoyama, Naoki; and Komori, Shigeki, 4,522,540, Cl. 409-293.000.

Kawai, Hisasi; Ina, Toshikazu; Igashira, Toshihiko; Nomura, Ken; Yoshida, Masakazu; Komoda, Takao; and Hamanishi, Makio, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Temperature compensated fuel injection system for internal combustion engines. 4,522,177, Cl. 123-478.000.

Kawai, Toshikazu; Suzuki, Haruo; and Kaneda, Shouzou, to Central Glass Company, Limited. Method of purifying 4-fluorophenol. 4,523,041, Cl. 568-755.000.

Kawajiri, Kazuhiro: *See*—
Hirose, Masataka; Kawajiri, Kazuhiro; and Nakajima, Yosuke, 4,523,214, Cl. 357-30.000.

Kawakami, Tetsuya: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Hiraoka, Ryosei; Matsumoto, Hidekazu; Ide, Jushi; and Kawakami, Tetsuya, 4,523,272, Cl. 364-200.000.

Kawakatsu, Yoshifumi: *See*—
Yoshinari, Osamu; Kawakatsu, Yoshifumi; and Fukuizumi, Hideaki, 4,522,801, Cl. 423-447.400.

Kawamoto, Isao: *See*—
Koguchi, Toshiro; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Okachi, Ryo; and Nakayama, Kiyoshi, 4,522,812, Cl. 514-7.000.

Kawamura, Toshimi, to Mitsubishi Denki Kabushiki Kaisha. Power storage system for electric railway. 4,523,059, Cl. 191-6.000.

Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, to Kabushiki Kaisha Suwa Seikosha. Step motor control mechanism for electronic timepiece. 4,522,507, Cl. 368-157.000.

Kawasaki Steel Corporation: *See*—
Koshikawa, Takao; Ueda, Tsunehiro; and Ozeki, Tadao, 4,522,251, Cl. 164-491.000.

Kayser, Robert B.: *See*—
Purcell, Robert F.; and Kayser, Robert B., 4,522,732, Cl. 252-8.55D.

Kayser-Roth Hosiery, Inc.: *See*—
Casstevens, Arvil; Coble, William H.; Shields, Harper; Ferrell, Roscoe M.; and Jordan, Bobby R., 4,522,042, Cl. 66-140.00S.
Lineberry, Roger D.; and Shields, Harper, 4,522,044, Cl. 66-185.000.

Kazama, Toyoki: *See*—
Kina, Hideki; Iijima, Toshiyuji; Tanabe, Eizo; Kazama, Toyoki; and Namba, Masaharu, 4,522,904, Cl. 430-54.000.

Kazufumi, Ogawa; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, to Matsushita Electric Industrial Co., Ltd. Solid-state color-image sensor and process for fabricating the same. 4,523,102, Cl. 250-578.000.

Keck, Daniel H.; Braun, Ralph V.; and Majors, Mark B., to Kimberly-Clark Corporation. Soft nonwoven laminate bonded by adhesive on reinforcing scrim. 4,522,863, Cl. 428-196.000.

Kecskemethy, Geza; Kovacsay, Istvan; and Magdanyi, Laszlo , to Muanyagipari Kutato Intezet. Procedure for curing unsaturated polyester resins. 4,522,963, Cl. 523-510.000.

Keefer, Donald W., to Classic Corp. Heated waterbed. 4,521,929, Cl. 5-422.000.

Keel, Beat G.; and Johnson, Robert W., to Control Data Corporation. Magnetic head preamplifier/driver. 4,523,238, Cl. 360-46.000.

Keene, Christopher B.: *See*—
Clark, George W.; and Keene, Christopher B., 4,522,299, Cl. 206-315.300.

Kehr, Wolfgang: *See*—
Dorow, Rainer; Horowski, Reinhard; Kehr, Wolfgang; and Wachtel, Helmut, 4,522,820, Cl. 424-288.000.

Keikoku Piston Ring Co., Ltd.: *See*—
Kubo, Yukihiko, 4,522,412, Cl. 277-138.000.

Keiper Recaro GmbH & Co.: *See*—
Goldner, Walther; and Gassmann, Wolfgang, 4,522,445, Cl. 297-284.000.

Keller-Steinbach, Christiane, to Eltec Instrument A.G. Radiation detector with asymmetrical pattern. 4,523,095, Cl. 250-349.000.

Kelley, Everett J., to Rohm and Haas Company. Acrylic or methacrylic terminated oligomers. 4,523,028, Cl. 560-199.000.

Kellner, Jackson M.; and Garrett, William R., to Smith International Inc. Multiple conduit drill pipe. 4,522,234, Cl. 138-108.000.

Kelly, Lawrence S.; McCormick Marty P.; and Weikel, William A., to Graco Inc. Plural component mixing and dispensing system. 4,522,789, Cl. 422-133.000.

Kelly, Timothy A.; and Turbyfill, Rueben M., to Ventilator Associates. Ventilator for vehicle. 4,522,115, Cl. 98-2.140.

Kelm, Edward C.: *See*—
Chivens, Donald R.; Greskovics, Paul; and Kelm, Edward C., 4,522,221, Cl. 137-118.000.

Kemper, Yves J., to Caterpillar Tractor Co. Continuously variable transmission unit. 4,522,079, Cl. 74-191.000.

Kendall Company, The: *See*—
Thomas, Samuel J.; Robich, James M.; and Hayes, Robert L., 4,523,141, Cl. 324-54.000.

Kennis, Ludo: *See*—
Vandenberk, Jan; Kennis, Ludo; Van der Aa, Marcel; and Van Heertum, Albert, 4,522,945, Cl. 514-259.000.

Kent, Harold B.: *See*—
McGaffigan, Thomas H.; and Kent, Harold B., 4,522,457, Cl. 339-30.000.

Kerchiss, Roman R., to RK Chemical Company Limited. Printing ink proofer. 4,522,057, Cl. 73-150.00R.

Kerns, David V., Jr.: *See*—
Sulouff, Robert E.; Hartin, Sam S.; Cook, Koy B.; Kerns, David V., Jr.; Davidson, Jimmy L.; and Warren, Keith O., 4,522,072, Cl. 73-765.000.

Kerr-McGee Corporation: *See*—
Carey, Henry S., Jr., 4,522,222, Cl. 137-240.000.
Kauffman, Jim W.; and Laughlin, William C., 4,522,723, Cl. 210-611.000.

Kerrey, John S.; and Duncan, Robert, to Westinghouse Electric Corp. Grid and sleeves welding fixture and method. 4,522,330, Cl. 228-182.000.

Ketterer, Stanley J., to Singer Company, The. Feed controlling arrangement for button sewing machine. 4,522,133, Cl. 112-112.000.

Ketterer, Stanley J., to Singer Company, The. Looper and cam assembly for chain stitch sewing machine. 4,522,135, Cl. 112-199.000.

Keyser, Joachim H.: *See*—
Bohlen, Harald; Kaus, Gerhard; Greschner, Johann; Keyser, Joachim H.; and Kulcke, Werner, 4,522,893, Cl. 428-641.000.

Khanna, Satish K.; Thakoor, Anilkumar P.; and Williams, Roger M., to United States of America, Administrator, National Aeronautics and Space Administration. Corrosion resistant coating. 4,522,844, Cl. 427-38.000.

Kibler, Holly S.: *See*—
Berry, W. Wess; Schmeda, Rae A.; and Kibler, Holly S., 4,522,726, Cl. 210-660.000.

Kiefer, Jakob: *See*—
Heidegger, Peter; and Kiefer, Jakob, 4,523,219, Cl. 357-79.000.

Kiernan, Jane A., to American Cyanamid Company. Phenylethane derivatives and acid addition salts thereof for increasing lean meat deposition and/or improving lean meat to fat ratio in warm blooded animals. 4,522,822, Cl. 514-376.000.

Kiesler, James A.: *See*—
Sharkozy, Frank L.; and Kiesler, James A., 4,522,912, Cl. 430-278.000.

Kilfeather, James F., Jr.: *See*—
Hanson, John R.; Hauser, James L.; Kilfeather, James F., Jr.; and Hendriks, Hendrik B., 4,522,667, Cl. 156-87.000.

Killion, John J., III: *See*—
Wickman, John A.; Killion, John J., III; and Deschenes, Charles, 4,522,288, Cl. 190-106.000.

Kilroy, Eugene J.; Morse, James E.; Grimm, Thomas H.; and DeAnda, Nicholas, to Mattel, Inc. Toy railroad vehicle with alignment bias. 4,522,607, Cl. 446-447.000.

Kimberly-Clark Corporation: *See*—
Bolick, Martha E., 4,522,624, Cl. 604-385.00R.
Keck, Daniel H.; Braun, Ralph V.; and Majors, Mark B., 4,522,863, Cl. 428-196.000.
Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., 4,522,967, Cl. 524-377.000.

Kimchi, Yigal: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, 4,522,720, Cl. 210-512.100.

Kimura, Takahiko: *See*—
Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuji, 4,522,176, Cl. 123-339.000.

Kina, Hideki; Iijima, Toshiyuji; Tanabe, Eizo; Kazama, Toyoki; and Namba, Masaharu, to Fuji Electric Company, Ltd.; and Fuji Electric Corporate Research & Development, Ltd. Electrophotographic process. 4,522,904, Cl. 430-54.000.

King, Charles: *See*—
Scott, John T.; and King, Charles, 4,522,860, Cl. 428-132.000.

King, James L.; and Hennessy, John E., to General Electric Company. Method of assembling a dynamoelectric machine. 4,521,953, Cl. 29-596.000.

Kingsnorth, Stanley W.: *See*—
Eynon, David L.; Kingsnorth, Stanley W.; and Varma, Mani K., 4,522,687, Cl. 162-336.000.
Kinoshita, Hisashi; Yoshitake, Hideki; and Kake, Nin, to Matsushita Electrical Industrial Co., Ltd. Control system for DC motors. 4,523,134, Cl. 318-313.000.
Kinoshita, Kinjiro, to Yamato Scale Company, Limited. Gate driving device. 4,522,321, Cl. 222-504.000.
Kinoshita, Mitsuo: *See*—
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,523,073, Cl. 219-69.00W.
Kirby, Edward R.: *See*—
Douthit, C. Staton; and Kirby, Edward R., 4,522,547, Cl. 414-391.000.
Kiruna Truck AB: *See*—
Niva, Karl-Erik, 4,522,549, Cl. 414-474.000.
Kishi, Hajimu; and Seki, Masaki, to Fanuc Ltd. Method and device for creating curved surfaces. 4,523,270, Cl. 364-191.000.
Kishi, Ichiro, to Matsushita Electric Works, Ltd. Hand-held electric tool. 4,522,270, Cl. 173-163.000.
Kistler-Morse Corporation: *See*—
Kistler, Walter P.; and Chinn, Martin D., 4,522,066, Cl. 73-781.000.
Kistler, Walter P.; and Chinn, Martin D., to Kistler-Morse Corporation. Temperature-compensated extensometer. 4,522,066, Cl. 73-781.000.
Kitagawa, Junji; Akita, Shigeyuki; Kasegawa, Norimichi; and Nakamura, Akira, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Torque sensor. 4,522,278, Cl. 180-79.100.
Kitagawa, Yoshihiko: *See*—
Fukushima, Nobuo; Kitagawa, Yoshihiko; Okumura, Takuzo; and Sakakura, Kazuaki, 4,522,955, Cl. 521-143.000.
Kitahiro, Isamu: *See*—
Kazufumi, Ogawa; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,523,102, Cl. 250-578.000.
Kitajima, Goro : *See*—
Nemoto, Shigeru; Kitajima, Goro ; Saitou, Sinichi; and Osada, Hazime, 4,523,247, Cl. 360-137.000.
Kitao, Shoichi: *See*—
Murata, Michihiro; and Kitao, Shoichi, 4,522,060, Cl. 73-336.500.
Kitayama, Tatsuki: *See*—
Hatada, Koichi; Okamoto, Yoshio; and Kitayama, Tatsuki, 4,523,000, Cl. 526-336.000.
Kittle, Donald. Combination vehicle, shock absorber and tool to remove said shock absorbers from said vehicle. 4,522,090, Cl. 81-55.000.
Klaren, Dick G., to Esmil B.V. Method of operating a liquid-liquid heat exchanger. 4,522,252, Cl. 165-1.000.
Klein, Howard P.: *See*—
Cuscurida, Michael; and Klein, Howard P., 4,523,025, Cl. 560-26.000.
Klein, Joachim; Widdecke, Hartmut; Doscher, Frank; and Pohl, Fritz, to Hoechst Aktiengesellschaft. Process for the fluorination of polymers, and perfluorinated ion exchangers. 4,522,952, Cl. 521-31.000.
Klein, Michael: *See*—
Struck, Helmut; Richter, Karl H.; Klein, Michael; Ruth, Ulrich; and Ulke, Walter, 4,522,418, Cl. 280-95.00A.
Klem, Per G., to Harding A/S. Life saving system for marine structure. 4,522,144, Cl. 114-348.000.
Klieman, Charles H.; and Densmore, Richard M., to Klieman, Charles H. Spring activated hemostatic clip applicator. 4,522,207, Cl. 128-325.000.
Kling, Dieter: *See*—
Balsys, Manfred; Kling, Dieter; Maier, Hans; Miller, Franz; and Schmid, Walter, 4,522,223, Cl. 137-240.000.
Klink, Rainer, to Deutsche Automobilgesellschaft mit beschrankter Haftung. Frictional lining for a wet clutch or brake. 4,522,290, Cl. 192-107.00M.
Klippan GmbH Sicherheitsgerate: *See*—
Weman, Olaf, 4,522,426, Cl. 280-808.000.
Klostermeier, Werner; Lasher, Jeffery D.; Meyer, Gerhard; and Zengel, Hans, to Akzona Incorporated. Thick polyimide-metal laminates with high peel strength. 4,522,880, Cl. 428-332.000.
Kluss, Karl K.; Allen, Terry F.; and Sawyer, John M., to Goodyear Tire & Rubber Company, The. Hose structure. 4,522,235, Cl. 138-130.000.
Knaak, Joachim, to INTERATOM Internationale Atomreaktorbau GmbH. Magnetic-inductive flow meter for high temperatures. 4,522,073, Cl. 73-861.120.
Knapp, Furn F., Jr.; and Goodman, Mark M., to United States of America, Energy. Heart testing compound. 4,523,033, Cl. 562-496.000.
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Erdmann, Jurgen; Buchholz, Karl O.; and Knappe, Hartmut, 4,523,251, Cl. 361-152.000.
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Marlettini, Maria G.; DeNovellis, Michelangelo; Labriola, Ernesto; Salomone, Teresa; and Tomassetti, Paola, 4,522,827, Cl. 514-671.000.
Knote, Charles E. Bait station and trap. 4,521,987, Cl. 43-131.000.
Knowles, Joe E.; and Winters, Mellie E., to Coleman Company, Inc., The. Non-pull apart telescoping roof jack assembly for furnace. 4,522,191, Cl. 126-307.00R.
Knutti, David F.: *See*—
Jacobsen, Stephen C.; Knutti, David F.; and Johnson, R. Todd, 4,521,924, Cl. 3-1.100.
Kobayashi, Hisao: *See*—
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Kobayashi, Kazuo: *See*—
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Kobayashi, Nobuo, to Tomy Kogyo Company, Incorporated. Toy arcade game. 4,522,409, Cl. 273-316.000.
Kobelt, Jacob. Double-acting, fluid actuated positioning actuator. 4,522,111, Cl. 92-48.000.
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Koberle, Karl. Flow measuring system including a venturi. 4,522,077, Cl. 73-861.630.
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Johnson, Edward J.; and Koble, Robert L., Jr., 4,522,558, Cl. 416-187.000.
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Grunberg, Kurt; Poth, Rainer; Werner, Peter; Koch, Kurt; Schweppe, Friedrich; and Voigtlander, Kurt, 4,523,253, Cl. 361-335.000.
Kocher, Hans R.: *See*—
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Koda, N. John, to United States of America, National Aeronautics and Space Administration. Liquid crystal light valve structures. 4,522,469, Cl. 350-342.000.
Koebisu, Mamoru; Shinzawa, Masayuki; and Murakami, Masatsugi, to Toray Industries, Inc. Laminated film of biaxially oriented polypropylene and an olefin polymer film. 4,522,887, Cl. 428-461.000.
Koga, Tatsumi. Net fabric for trawling. 4,521,986, Cl. 43-9.000.
Koga, Tsuguaki; Kuwashima, Hidesumi; Inoue, Hidenori; Hamaoka, Hidetoshi; and Ohta, Hiroshi, to Hitachi, Ltd.; Hitachi Engineering Co.; and Hitachi Service Engineering Co., Ltd. Apparatus for making diagnosis of valve device in turbine system. 4,523,286, Cl. 364-494.000.
Kogawa, Takashi, to Hitachi, Ltd. Safety maintaining apparatus for automatic machines. 4,523,135, Cl. 318-565.000.
Kogawa, Takashi, to Hitachi, Ltd. Method for extrapolating a path of a robot and apparatus therefor. 4,523,287, Cl. 364-513.000.
Koguchi, Toshiro; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Okachi, Ryo; and Nakayama, Kiyoshi, to Kyowa Hakko Kogyo Co., Ltd. Novel physiologically active substance K-4, a process for preparation thereof and a pharmaceutical composition containing the same. 4,522,812, Cl. 514-7.000.
Kohno, Yoshihiko: *See*—
Soma, Masafumi; and Kohno, Yoshihiko, 4,523,289, Cl. 364-569.000.
Kohsaka, Hideo; Sasaki, Mitsuru; and Ishiguri, Yukio, to Sumitomo Chemical Company, Limited. Phosphoramidothionates and fungicidal use. 4,522,817, Cl. 514-95.000.
Kohsaka, Hideo; Mitsuru, Sasaki; and Ishiguri, Yukio, to Sumitomo Chemical Company, Limited. Phosphoramidothionates. 4,522,942, Cl. 514-95.000.
Koichi, Yasushi: *See*—
Imai, Chikara; and Koichi, Yasushi, 4,522,481, Cl. 355-3.0DD.
Koide, Akio, to Janome Sewing Machine Industry Co., Ltd. Clutch for sewing machine thread winding mechanism. 4,522,140, Cl. 112-279.000.
Koishi, Kenji: *See*—
Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, 4,523,304, Cl. 369-32.000.
Koizumi, Hajime; Ohara, Shumpei; Kouda, Kiyoshi; Nagatomo, Muneshige; Sagara, Noriyasu; Togari, Satoshi; and Izumiyama, Hiroo, to Kajima Kensetsu Kabuhiki Kaisha. Heat storage trough. 4,522,254, Cl. 165-34.000.
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Kollmorgen Technologies Corporation: *See*—
Leech, Edward J., 4,522,850, Cl. 427-304.000.
Komiyama, Makoto: *See*—
Hirai, Hidefumi; and Komiyama, Makoto, 4,523,031, Cl. 562-475.000.
Hirai, Hidefumi; and Komiyama, Makoto, 4,523,037, Cl. 568-442.000.
Komoda, Takao: *See*—
Kawai, Hisasi; Ina, Toshikazu; Igashira, Toshihiko; Nomura, Ken; Yoshida, Masakazu; Komoda, Takao; and Hamanishi, Makio, 4,522,177, Cl. 123-478.000.
Komori, Shigeki: *See*—
Hasebe, Nobuhisa; Kawada, Hiroshi; Yokoyama, Naoki; and Komori, Shigeki, 4,522,540, Cl. 409-293.000.
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Hayashi, Nobutaka; and Komori, Yoshinori, 4,523,236, Cl. 358-341.000.

Konak, A. Riza, to Exxon Production Research Co. Method and apparatus for splitting two-phase flow at pipe tees. 4,522,218, Cl. 137-3.000.

Konaka, Masami; Iwai, Hiroshi; and Nishi, Yoshio, to VLSI Technology Research Association. MOS Semiconductor device and method of manufacturing the same. 4,523,213, Cl. 357-23,700.

Kondo, Masatoshi: *See*—
Nakate, Hiroshi; Kondo, Masatoshi; and Gosho, Nobuyuki, 4,523,072, Cl. 219-67.000.

Kondo, Shigeru: *See*—
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Konishi, Satoshi; and Sashiki, Takashi, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method. 4,522,274, Cl. 177-25.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Iwaki, Akio; Suzuki, Norihito; Yamamoto, Takeshi; and Aoki, Toru, 4,522,891, Cl. 428-626.000.

Konkol, Werner: *See*—
Cornils, Boy; Hibbel, Josef; Lieder, Bernhard; Much, Joachim; Schmidt, Volkmar; Wiebus, Ernst; and Konkol, Werner, 4,523,036, Cl. 568-454.000.

Kono, Hiroya: *See*—
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,522,567, Cl. 417-270.000.

Konrath, Karl: *See*—
Greiner, Max; and Konrath, Karl, 4,522,181, Cl. 123-502.000.

Konshak, Michael V., to Magnetic Peripherals Inc. Equipment module. 4,523,254, Cl. 361-391.000.

Koontz, Merwyn L.: *See*—
Hagedorn, Floyd T.; and Koontz, Merwyn L., 4,522,641, Cl. 65-291.000.

Korte, Siegfried: *See*—
Neukam, Theo; Brauer, Wolfgang; and Korte, Siegfried, 4,522,764, Cl. 260-456.00R.

Korthoff, Herbert W.; and Tompkins, Thomas M., to United States Surgical Corporation. Surgical fastener applying apparatus. 4,522,327, Cl. 227-19.000.

Koshikawa, Takao; Ueda, Tsunehiro; and Ozeki, Tadao, to Kawasaki Steel Corporation. Method of increasing casting width for a slab during a continuous casting operation. 4,522,251, Cl. 164-491.000.

Kotzin, Bernard. Rocking scale. 4,522,277, Cl. 177-250.000.

Kouda, Kiyoshi: *See*—
Koizumi, Hajime; Ohara, Shumpei; Kouda, Kiyoshi; Nagatomo, Muneshige; Sagara, Noriyasu; Togari, Satoshi; and Izumiyama, Hiroo, 4,522,254, Cl. 165-34.000.

Kovacsay, Istvan: *See*—
Kecskemethy, Geza; Kovacsay, Istvan; and Magdanyi, Laszlo , 4,522,963, Cl. 523-510.000.

Koyama, Kenji; Ohno, Syotaro; and Fukuda, Mitsutoshi, to Toyo Soda Manufacturing Co., Ltd. Process for separating plasma albumin. 4,522,725, Cl. 210-639.000.

Koyo Seiko Company Limited: *See*—
Miki, Toshio; Toda, Yoshihide; and Horii, Kenichi, 4,522,515, Cl. 384-571.000.

Kozlik, Antonin: *See*—
Jeffery, James E.; Kozlik, Antonin; and Wilmshurst, Eric C., 4,522,828, Cl. 514-646.000.

Kraemer, John F.: *See*—
Seeney, Charles E.; and Kraemer, John F., 4,522,651, Cl. 106-38.300.
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,522,799, Cl. 423-306.000.

Kramer, Manfred: *See*—
Gelse, Hans-Dieter; Heger, Werner; and Kramer, Manfred, 4,522,568, Cl. 417-307.000.

Kramler, Josef: *See*—
Kuhn-Kuhnenfeld, Franz; Kramler, Josef; and Gerber, Hans-Adolf, 4,522,656, Cl. 148-1.500.

Kraser, Gary S. Cigarette lighter. 4,522,583, Cl. 431-125.000.

Kraus, Theodore C.: *See*—
O'Connor, James M.; Kraus, Theodore C.; and Schnabel, Wilhelm J., 4,522,975, Cl. 524-702.000.

Kregness, Glen R., to Sperry Corporation. Fast error checked multibit multiplier. 4,523,210, Cl. 364-760.000.

Kress, Bruce A.: *See*—
Kallestad, Daniel R.; Kress, Bruce A.; and Satre, Kenneth I., 4,522,335, Cl. 236-44.00C.

Krevitz, Kenneth: *See*—
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,523,043, Cl. 568-840.000.

Kriegel, Ernst; and Coenen, Hubert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for processing used oil. 4,522,707, Cl. 208-180.000.

Krile, David J.: *See*—
Norris, Frank A.; and Krile, David J., 4,523,104, Cl. 307-247.00A.

Krimminger, Kenneth R.: *See*—
Hyde, Rebecca A.; Krimminger, Kenneth R.; and Swander, Robert E., 4,522,616, Cl. 493-44.000.

Kristoffersen, Bjorn R.: *See*—
Chen, Tyen C.; Busching, Forrest B.; Hale, William D.; and Kristoffersen, Bjorn R., 4,521,925, Cl. 4-362.000.

Krivanek, Louis: *See*—
Lund, David L.; Majumdar, Senajit J.; Mullane, William E.; and Krivanek, Louis, 4,523,068, Cl. 219-10.530.

Kroetsch, Charles F., to GTE Valeron Corporation. Touch probe having nonconductive contact carriers. 4,523,063, Cl. 200-61.410.

Krohn, Ulrich: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,522,171, Cl. 123-270.000.
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Kroll, John W.; and Hyink, Roy, to Eaton Corporation. SME shutter mechanism. 4,522,147, Cl. 116-216.000.

Krueger, Achim R., to Du Pont de Nemours, E. I., and Company. Two-package urethane maintenance primer. 4,522,879, Cl. 428-323.000.

Kryos Energy Inc.: *See*—
Markbreiter, Stephen J.; and Schorr, Hans P., 4,522,636, Cl. 55-23.000.

Kubo, Yukihiko, to Keikoku Piston Ring Co., Ltd. Oil ring with coil expander. 4,522,412, Cl. 277-138.000.

Kuboki, Shigeo; and Kato, Kazuo, to Hitachi, Ltd. Analog to digital converter. 4,523,180, Cl. 340-347.0AD.

Kubotsu, Akira: *See*—
Akagi, Takao; Yamaguchi, Shinji; and Kubotsu, Akira, 4,522,873, Cl. 428-283.000.

Kubushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Suzuki, Takatoshi; Tachikawa, Hideo; and Moriyama, Shigeo, 4,522,660, Cl. 148-20.300.

Kuchirka, Peter J.: *See*—
Argall, Bruce M.; Kuchirka, Peter J.; and Radford, Kenneth C., 4,522,744, Cl. 252-478.000.

Kuck, David L., to Iceberg Cribs, Inc. Ice crib. 4,522,537, Cl. 405-288.000.

Kudler, Paul S., to Majestic Rides Mfg. Co. Bumper car ride. 4,522,390, Cl. 272-29.000.

Kuether, Christian L. Bath chair. 4,521,926, Cl. 4-579.000.

Kuhlein, Klaus: *See*—
Schmitz, Hermann; and Kuhlein, Klaus, 4,522,997, Cl. 526-264.000.

Kuhn, Elmar, to Astor-Werk, Otto Berning & Co. Feller attachment for a heat-sealing machine for belts. 4,522,677, Cl. 156-467.000.

Kuhn-Kuhnenfeld, Franz; Kramler, Josef; and Gerber, Hans-Adolf, to Wacker-Chemitronic Gesellschaft Fur Elektronik-Grundstoffe mbH. Method of making reference surface markings on semiconductor wafers by laser beam. 4,522,656, Cl. 148-1.500.

Kuhn, Patrick: *See*—
Shelbourn, William C.; Kuhn, Patrick; and Vig, Michael A., 4,522,373, Cl. 251-297.000.

Kuhn, William E.; Hu, Kwoh H.; and Black, Stanley A., to University of Cincinnati. Flexible electrochemical heater. 4,522,190, Cl. 126-263.000.

Kukes, Simon G.; and Battiste, David R., to Phillips Petroleum Company. Demetallization of heavy oils with phosphorous acid. 4,522,702, Cl. 208-89.000.

Kukes, Simon G.; and Banks, Robert L. Metathesis catalyst. 4,522,936, Cl. 502-249.000.

Kulcke, Werner: *See*—
Bohlen, Harald; Kaus, Gerhard; Greschner, Johann; Keyser, Joachim H.; and Kulcke, Werner, 4,522,893, Cl. 428-641.000.

Kulkaski, Bernard J.: *See*—
Sayer, Bertram; and Kulkaski, Bernard J., 4,521,991, Cl. 49-161.000.

Kulprathipanja, Santi: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,522,761, Cl. 260-419.000.

Kulzer & Co. GmbH: *See*—
Schaefer, Roland, 4,522,694, Cl. 204-159.240.

Kumada, Akira: *See*—
Murata, Michihiro; and Kumada, Akira, 4,523,142, Cl. 324-65.00R.

Kumagae, Yojiro; and Iwasaki, Yasuhisa, to Yamamoto Kagaku Gosei Co., Ltd. Certain bis(benzoyl)pyridine compounds. 4,523,018, Cl. 546-315.000.

Kumahara, Katsumi: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,522,994, Cl. 526-351.000.

Kummeke, Heinrich: *See*—
Greune, Christian; and Kummeke, Heinrich, 4,522,025, Cl. 60-39.150.

Kummer, Rudolf; Schneider, Heinz-Walter; Taglieber, Volker; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Purification of carboxylates containing aldehydes, acetals and/or unsaturated compounds. 4,523,027, Cl. 560-191.000.

Kundrot, Robert A. Deacidification of library materials. 4,522,843, Cl. 427-27.000.

Kunicki, Maryan; and Roussel, Michel. Process for desulfurization of gases with molten mineral baths during gasification of carbon products. 4,522,648, Cl. 75-24.000.

Kunkel, Fred: *See*—
Heine, Heinrich; Herzan, Georg; and Kunkel, Fred, 4,522,388, Cl. 271-245.000.

Kuo, Meng S.: *See*—
Chu, Mosi; and Kuo, Meng S., 4,522,382, Cl. 270-1.100.

Kupcikevicius, Vytautas, to Union Carbide Corporation. Casing sizing means, method and apparatus. 4,521,938, Cl. 17-49.000.

Kurahashi, Keizo: *See*—
Takahara, Kazuhiro; Kurahashi, Keizo; Gondo, Hiroyuki; Oki, Kenichi; and Miura, Shoshin, 4,523,189, Cl. 340-781.000.

Kurahashi, Muneshige; and Yamamori, Shinji, to Nihon Kohden Corporation. Respiratory gas concentration measuring apparatus. 4,522,204, Cl. 128-719.000.

Kuraray Co., Ltd.: *See*—
Akagi, Takao; Yamaguchi, Shinji; and Kubotsu, Akira, 4,522,873, Cl. 428-283.000.
Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,523,024, Cl. 549-407.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Shigeta, Masatomo; Fukuda, Hiroyuki; Saitoh, Kuniyuki; and Kaji, Hisatsugu, 4,522,895, Cl. 429-44.000.

Kurkov, Victor P., to Chevron Research Company. Fused 5,6,5-membered heterocyclic electroactive polymers. 4,522,745, Cl. 252-500.000.

Kurt Vogelsang GmbH: *See*—
Vogelsang, Kurt, 4,522,523, Cl. 401-126.000.

Kurtz, Richard F.: *See*—
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.

Kuwajima, Soichi; and Sakamoto, Naojiro, to Nihon Schumacher K.K.; and Toyo Element Kogyo Kabushiki Kaisha. Filter with a tubular filter element. 4,522,719, Cl. 210-457.000.

Kuwashima, Hidesumi: *See*—
Koga, Tsuguaki; Kuwashima, Hidesumi; Inoue, Hidenori; Hamaoka, Hidetoshi; and Ohta, Hiroshi, 4,523,286, Cl. 364-494.000.

Kuzma, Janusz A.: *See*—
Patrick, James F.; Crosby, Peter A.; Kuzma, Janusz A.; and Money, David K., 4,522,209, Cl. 128-419.00R.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Koguchi, Toshiro; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Okachi, Ryo; and Nakayama, Kiyoshi, 4,522,812, Cl. 514-7.000.

Kytta, Oswald O.; and Bach, Lloyd G., to Bendix Corporation, The. Fluid pressurizing device. 4,522,031, Cl. 60-547.100.

Labib, Mohamed E.; Poll, Robert F.; and Wang, Chih-Chun, to RCA Corporation. Capacitance electronic disc molding compositions. 4,522,747, Cl. 252-511.000.

Laboratoire Suisse de Recherches Horlogeres: *See*—
Lammer, Johann; Kocher, Hans R.; and Hintermann, Hans-Erich, 4,522,453, Cl. 308-3.00R.

LaBounty, Roy E. Rail lifting and breaking machine. 4,522,323, Cl. 225-2.000.

Labriola, Ernesto: *See*—
Marlettini, Maria G.; DeNovellis, Michelangelo; Labriola, Ernesto; Salomone, Teresa; and Tomassetti, Paola, 4,522,827, Cl. 514-671.000.

Laemmle, Joseph T.; Bohaychick, John; and Lansdale, Willie, to Aluminum Company of America. Continuous casting with glycerol trioleate parting composition. 4,522,250, Cl. 164-472.000.

Lagow, Richard J.; and Gerhardt, Glenn E., to University of Texas, The. Method for forming perfluorocarbon ethers. 4,523,039, Cl. 568-615.000.

Lai, John T., to B. F. Goodrich Company, The. 3,5-Dialkyl-4-hydroxyphenyl-substituted acetic acids. 4,523,032, Cl. 562-478.000.

Lair, Clair K.; Jonas, Jules; and Anderson, Keith D., to General Dynamics, Pomona Division. Multiple target seeking clustered munition and system. 4,522,356, Cl. 244-3.150.

Lakes, Stephen D.: *See*—
Lewis, Maurice W.; and Lakes, Stephen D., 4,523,207, Cl. 346-214.000.

Lammer, Johann; Kocher, Hans R.; and Hintermann, Hans-Erich, to Laboratoire Suisse de Recherches Horlogeres. Tribological coatings for the protection of moving machine parts from wear and corrosion. 4,522,453, Cl. 308-3.00R.

Landa, Benzion, to Savin Corporation. Electrophotographic apparatus for increasing the apparent sensitivity of photoconductors. 4,522,484, Cl. 355-3.0DD.

Landis, Phillip S.: *See*—
Horodysky, Andrew G.; and Landis, Phillip S., 4,522,629, Cl. 44-53.000.

Lang, Erberhard: *See*—
Dinger, Hans; Holzhauer, Hilbert; and Lang, Erberhard, 4,522,358, Cl. 244-110.00B.

Lang, Gerard: *See*—
Jacquet, Bernard; Lang, Gerard; and Malaval, Alain, 4,522,808, Cl. 424-59.000.

Langenfeld, Wilhelm, to Didier-Werke A.G. Gas flushing inlet arrangement in a metallurgical vessel and method of operation of such an arrangement. 4,522,376, Cl. 266-47.000.

Lansdale, Willie: *See*—
Laemmle, Joseph T.; Bohaychick, John; and Lansdale, Willie, 4,522,250, Cl. 164-472.000.

Large, Scott F.; and Metcalf, Bruce D., to Mitre Corporation, The. Fiber optic bidirectional wavelength division multiplexer/demultiplexer with total and/or partial redundancy. 4,522,462, Cl. 350-96.190.

Larson, Harold A.; Boehme, Manfred F.; and Sheets, Jeffrey W. Removing H_2S from natural gas using two-stage molecular sieves. 4,522,793, Cl. 423-230.000.

Larson, Leslie N. Drilling rig. 4,522,273, Cl. 175-135.000.

Larson, Marlow W. Illuminated sighting structure for archery bows. 4,521,972, Cl. 33-265.000.

Larson, Ulf R.; and Schmidt, Max-Gunther. Apparatus for discharging liquid-covered particles from a reaction chamber and subsequent drying of said particles. 4,522,589, Cl. 432-239.000.

Lasher, Jeffery D.: *See*—
Klostermeier, Werner; Lasher, Jeffery D.; Meyer, Gerhard; and Zengel, Hans, 4,522,880, Cl. 428-332.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,522,826, Cl. 514-569.000.

Laskaris, Evangelos T., to General Electric Company. Horizontal cryostat penetration insert and assembly. 4,522,034, Cl. 62-45.000.

Lattimore, James: *See*—
Chisvette, Dominick; Lattimore, James; and Sova, Stanley G., 4,522,654, Cl. 106-288.00Q.

Laube, Robert W.: *See*—
Neuschaffer, Karl-Heinz; Engels, Hans-Werner; Gebert, Hans-Jurgen; Laube, Robert W.; and Zoche, Gunter, 4,522,652, Cl. 106-84.000.

Laue, Charles E., to Hamilton-Pax, Inc. Method for fabricating a valve. 4,521,948, Cl. 29-157.10R.

Laughlin, William C.: *See*—
Kauffman, Jim W.; and Laughlin, William C., 4,522,723, Cl. 210-611.000.

Lauterjung, Friedrich G. Suction bottle for medicinal purposes. 4,522,623, Cl. 604-319.000.

LaValley, Richard W. Shower pipes for rotary drum filter. 4,522,716, Cl. 210-210.000.

Lavine, Michael K. Device for transmitting analog sensor data via fiber optics. 4,523,099, Cl. 250-551.000.

Laymon, Charles R., to Welco Industries, Inc. Automatic welding machine which provides uniform welding of a workpiece during vertical movement thereof. 4,523,076, Cl. 219-125.100.

Lebesgue, Jean, to Fives-Cail Babcock. Installation for the thermal treatment of pulverulent mineral products. 4,522,131, Cl. 110-229.000.

Lebet, David P.: *See*—
Emanuelson, Roy M.; and Lebet, David P., 4,523,168, Cl. 335-296.000.

Leclercq, Joseph, to Framatome & Cie. Fuel assembly for a nuclear reactor. 4,522,782, Cl. 376-438.000.

Leclercq, Lucien; and Provost, Marcelle, to Eruotungstene-Poudres. Catalytic reforming process employing reforming catalysts which are based on tungsten and molybdenum carbides. 4,522,708, Cl. 208-136.000.

Leco Corporation: *See*—
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Anderson, Richard J.; and Lee, Shy-Fuh, 4,522,647, Cl. 71-94.000.

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Lepley, Joseph M., to Altronic, Inc. Silicon controlled rectifier shut-off circuit for capacitive discharge ignition system. 4,522,184, Cl. 123-599.000.

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Martin, Madeleine; Lesage, Jean; Courbin, Gerard; and Rivereau, Alain, 4,522,878, Cl. 428-313.700.

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Barby, Donald; and Haq, Zia, 4,522,953, Cl. 521-64.000.
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Levien, Raphael L. Software protection method and apparatus. 4,523,271, Cl. 364-200.000.

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Levinson, Samuel H.; and Caldicott, Jack R. Remote-controlled doorbell signal receiver. 4,523,193, Cl. 340-825.690.

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Girard, Thomas L.; and Lewis, Monty D., 4,522,396, Cl. 273-58.00K.

Lewison, Richard A., to Wetherell, Ronald D. Shredder/plow combination. 4,522,267, Cl. 172-28.000.

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Hagedorn, Floyd T.; and Koontz, Merwyn L., 4,522,641, Cl. 65-291.000.

Lickei, Donald L.: *See*—
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,522,969, Cl. 524-425.000.

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Liebert, Richard B.; and White, Roger P., to North American Philips Corporation. Electrophoretic image display with reduced drives and leads. 4,522,472, Cl. 350-362.000.

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Lind, Michael A.; and Dunn, Michael R., to New Draulics, Inc. Hydraulic cable and rod cutting and crimping device. 4,521,963, Cl. 30-92.000.

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Lohr, Heinz P., 4,522,236, Cl. 139-353.000.

Linde AG: *See*—
Karwat, Heinz, 4,522,638, Cl. 55-37.000.

Linde Aktiengesellschaft: *See*—
Becker, Hans, 4,522,637, Cl. 55-25.000.
Deininger, Horst, 4,522,566, Cl. 417-222.000.

Linder, Ernst: *See*—
Babitzka, Rudolf; and Linder, Ernst, 4,522,174, Cl. 123-300.000.

Lindgren, Erik V. Ski holder. 4,522,379, Cl. 269-47.000.

Lindig, Charles E.; Brandstetter, Robert W.; and Doucette, Adrian R., to Grumman Aerospace Corporation. Recursive optical filter system. 4,522,466, Cl. 350-162.120.

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Brown, William M.; and Lindquist, James R., 4,523,307, Cl. 370-30.000.

Lindsay, Harold W. Milling cutter with multiple indexable cutting inserts. 4,522,538, Cl. 407-35.000.

Lineberry, Roger D.; and Shields, Harper, to Kayser-Roth Hosiery, Inc. Ankle and arch support sock. 4,522,044, Cl. 66-185.000.

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Buttery, Ronald G.; Ling, Louisa C.; and Juliano, Bienvenido O., 4,522,838, Cl. 426-537.000.

Linnau, Yendra; and Schwarz, Otto, to Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte. Method for producing a preparation containing factor VIII (AHF). 4,522,751, Cl. 260-112.00B.

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Lenk, Robert P.; Fountain, Michael W.; Janoff, Andrew S.; Ostro, Marc J.; and Popescu, Micrea C., 4,522,803, Cl. 424-1.100.

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Little, Robert K. Peristaltic pump. 4,522,571, Cl. 417-476.000.

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Llauge, Joaquin R.; and Isanta, Alberto P., to ITW Espana S.A. Cock for the heating circuits of a vehicle. 4,522,225, Cl. 137-351.000.

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Logan, Richard H.: *See*—
Marchi, Gary C.; and Logan, Richard H., 4,522,109, Cl. 91-420.000.

Logue, DeWitt M. Retriever and dispenser for deformable balls. 4,522,438, Cl. 294-19.200.

Lohr, Heinz P., to Lindauer Dornier Gesellschaft mbH. Electrical system for monitoring warp yarns in weaving machines. 4,522,236, Cl. 139-353.000.

Long, Delmar D.: *See*—
Anderson, John F., Jr.; and Long, Delmar D., 4,522,869, Cl. 428-245.000.

Longacre, Andrew, Jr., to Welch Allyn Inc. Color filter wheel synchronizer. 4,523,224, Cl. 358-42.000.

Longoni, Angelo: *See*—
Regiroli, Giovanni; Caprioli, Vincenzo; and Longoni, Angelo, 4,522,825, Cl. 514-517.000.

L'Oreal: *See*—
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Lozfau, Arthur; and Lucey, William H., to Dennison National Company. Ring mechanism for loose leaf binders and method of manufacture therefor. 4,522,526, Cl. 402-37.000.

Lubke, Wilfried, to Siemens Aktiengesellschaft. Liquid-ring compressor for gases. 4,522,560, Cl. 415-210.000.

Luca, Vincent A., Jr.: *See*—
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Lucas Industries plc: *See*—
Mowbray, Dorian F., 4,522,182, Cl. 123-509.000.

Lucas, Jean: *See*—
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Luder, Rainer; and Haussmann, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for controlling the digital chrominance signals of a color television receiver. 4,523,223, Cl. 358-27.000.

Ludwick, Lanny E. One piece sanitary diaper changing station. 4,522,381, Cl. 269-328.000.

Lueddecke, Erik: *See*—
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Luitz, Max; and Weiss, Eugen, to ESS GmbH Skibindungen. Ski binding clamp. 4,522,424, Cl. 280-633.000.

Lukach, Carl; Majewicz, Thomas G.; and Reid, Albert R., to Hercules Incorporated. Dihydroxypropyl mixed ether derivatives of cellulose. 4,523,010, Cl. 536-91.000.

Lum, Genevieve S.; Li, Hsueh M.; and Pettigrew, F. Alexander, to Ethyl Corporation. Halophosphazene polymers. 4,522,798, Cl. 423-300.000.

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Lummus Company, The: *See*—
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Lummus Crest Inc.: *See*—
O'Sullivan, Thomas F.; and Gronauer, Thomas W., 4,522,157, Cl. 122-510.000.

Lund, David L.; Majumdar, Senajit J.; Mullane, William E.; and Krivanek, Louis, to GNB Batteries Inc. Apparatus and method for fusing battery terminals. 4,523,068, Cl. 219-10.530.

Lundberg, Robert D.: *See*—
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Lunghofer, Eugene P., to Dresser Industries, Inc. Hydraulic fracturing propping agent. 4,522,731, Cl. 252-8.55R.

Luque, Phillip R.: *See*—
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Lydall, Inc.: *See*—
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Lyons, James E.: *See*—
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M.A.N. Maschinenfabrik Augsburgg-Nurnberg Aktiengesellschaft: *See*—
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M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Burger, Rainer; Bittl, Gerhard; and Kobler, Ingo, 4,522,124, Cl. 101-350.000.
Heine, Heinrich; Herzan, Georg; and Kunkel, Fred, 4,522,388, Cl. 271-245.000.

M. P. Metal Products, Inc.: *See*—
Geib, Henry T., Sr.; and Griffith, Wayne C., 4,523,081, Cl. 219-370.000.

Maack, Werner; and Zendler, Richard, to AMP Incorporated. Apparatus for terminating flat flexible cables. 4,521,960, Cl. 29-749.000.

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Mac Valves, Inc.: *See*—
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Macey, Keith S., to K. S. Macey Machine Company, Inc. Reciprocating stitcher assembly. 4,522,383, Cl. 270-53.000.

Maciejewski, Walter J., to Gearhart Industries, Inc. Method and apparatus for determining the spontaneous earth potential log from downhole gradient measurements. 4,523,148, Cl. 324-351.000.

Maciorowski, Michael W. Balance toy. 4,522,403, Cl. 273-154.000.

Mackey, Charles P. Name belt with selective letter inserts. 4,521,923, Cl. 2-338.000.

Mackin, Steven J.; and Tillotson, Harry T., to General Motors Corporation. Boot cover for a floor-mounted transmission lever. 4,522,081, Cl. 74-473.00R.

Mackowiak, Jerzy: *See*—
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MacNamee, Richard W., to Sangamo Weston, Inc. Electrolytes for electrolytic capacitors. 4,522,737, Cl. 252-62.200.

Macy, Arnel M.: *See*—
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Maeda, Katsunosuke: *See*—
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Maeda, Naoki: *See*—
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Maeda, Takeshi; Mizoguchi, Yasumitsu; Takasago, Masahiro; Kaneda, Tokuya; and Tsunoda, Yoshito, to Hitachi, Ltd. Driving apparatus for semiconductor laser. 4,523,089, Cl. 250-205.000.

Maejima, Hideo; Masuda, Ikuro; Matsumoto, Hidekazu; and Miyazawa, Shyoichi, to Hitachi, Ltd. Input/output control device with memory device for storing variable-length data and method of controlling thereof. 4,523,276, Cl. 364-200.000.

Maes, Michel E.: *See*—
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Maffrand, Jean-Pierre: *See*—
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Mager, George E.: *See*—
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Maget, Henri J. R. Electrochemical prime mover. 4,522,698, Cl. 204-301.000.

Magid, David J.; and Ruckle, W. Thomas. Toilet bowl cleaner. 4,522,738, Cl. 252-90.000.

Magnetic Peripherals Inc.: *See*—
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Magnien, Ernest: *See*—
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Maguire, Helen E., to Advanced Input Devices, Inc. Combination keyboard. 4,523,060, Cl. 200-5.00A.

Mahon, Joseph J., to Eaton Corporation. Electrical appliance programming. 4,523,062, Cl. 200-35.00R.

Maier, Hans: *See*—
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Majestic Rides Mfg. Co.: *See*—
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Majors, Mark B.: *See*—
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Malaval, Alain: *See*—
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Malcolm, John I., to Coinaqua Limited. Particulate surface sports track surface and method for reconditioning such track surface. 4,522,389, Cl. 272-4.000.

Malskeit, Alfred: *See*—
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Man Design Co., Ltd.: *See*—
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Mandet, Gerard M. F.: *See*—
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Mankey, Harry S.: *See*—
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Mannschke, Lothar, to U.S. Philips Corporation. Optical multiplexer. 4,522,461, Cl. 350-96.180.

Mansfield Scientific, Inc.: *See*—
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Manten Co., Ltd.: *See*—
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Marchi, Gary C.; and Logan, Richard H., to J. I. Case Company. Leak-detecting hydraulic system. 4,522,109, Cl. 91-420.000.

Markbreiter, Stephen J.; and Schorr, Hans P., to Kryos Energy Inc.; and Brooklyn Union Gas Company, The. Pipeline gas pressure reduction with refrigeration generation. 4,522,636, Cl. 55-23.000.

Markert, Jurgen; Hagen, Helmut; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 3,7-Dichloroquinoline derivatives and their use for controlling undesirable plant growth. 4,522,646, Cl. 71-94.000.

Markle, Robert E.: *See*—
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Marks, Alvin M. Electrothermodynamic (ETD) power converter with conical jet. 4,523,112, Cl. 310-10.000.

Marlettini, Maria G.; DeNovellis, Michelangelo; Labriola, Ernesto; Salomone, Teresa; and Tomassetti, Paola, to Knoll AG. Method of treating acute pancreatitis with isometheptene. 4,522,827, Cl. 514-671.000.

Marquardt GmbH, Firma: *See*—
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Marquest Medical Products, Inc.: *See*—
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Marshall, Christopher B., to U.S. Philips Corporation. Direct modulation FM data receiver. 4,523,324, Cl. 375-91.000.

Martin, Madeleine; Lesage, Jean; Courbin, Gerard; and Rivereau, Alain, to Institut Francais du Petrole. Material having high mechanical strength and density close to unity, the manufacture and uses thereof. 4,522,878, Cl. 428-313.700.

Martin, Steven J. Fireplace starter. 4,522,585, Cl. 431-344.000.

Martin, William W., Jr.; and French, David W., to J-M Manufacturing Co., Inc. Apparatus for introducing a foamable plastic insulation into the space defined by an inner core pipe and an outer casing pipe while maintaining the spacing of the pipes. 4,522,578, Cl. 425-110.000.

Martinez, Danilo C.: *See*—
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Martino, Phillip C.; and Winner, Peter P., to SCM Corporation. Aqueous self-curing polymeric blends. 4,522,961, Cl. 523-407.000.

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Maruyama, Takashi. Tool for meals with the function of scissors. 4,521,964, Cl. 30-148.000.

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Marvin M. Stark Research Foundation: *See*—
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Masai, Siro: *See*—
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Masao, Mikami. Apparatus for manufacturing a roof lining for automobiles. 4,522,676, Cl. 156-443.000.

Massachusetts Institute of Technology: *See*—
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Masuda, Ikuro: *See*—
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Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; Yamamoto, Keisuke; and Yasumoto, Yoshio, to Matsushita Electric Industrial Co., Ltd. Image display apparatus. 4,523,225, Cl. 358-56.000.
Masunaga, Makoto, to Canon Kabushiki Kaisha. Distance measuring device. 4,522,492, Cl. 356-1.000.
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Albizzati, Enrico; Parodi, Sandro; and Barbe, Pier C., 4,522,930, Cl. 502-124.000.
Regiroli, Giovanni; Caprioli, Vincenzo; and Longoni, Angelo, 4,522,825, Cl. 514-517.000.
Montepolimeri S.p.A: *See*—
Gubitosa, Giuseppe; Berton, Antonio; Pernicone, Nicola; and Vidotto, Graziano, 4,522,931, Cl. 502-150.000.
Montgomery, Dan T.: *See*—
Nelson, Leon F.; Montgomery, Dan T.; Wyffels, Michael K.; and Sikula, William J., Jr., 4,522,553, Cl. 414-526.000.
Montres Universal S.A.: *See*—
Meister, Leonhard, 4,522,508, Cl. 368-276.000.
Mooney, Paul C. Locking spreader leg for tripod. 4,522,361, Cl. 248-188.800.
Moorcroft, Arthur L.: *See*—
Assard, Gerald L.; and Moorcroft, Arthur L., 4,523,120, Cl. 310-323.000.
Moores, Gregory E.: *See*—
Dibbern, John E., Jr.; and Moores, Gregory E., 4,523,116, Cl. 310-71.000.
Moormann, Alan E.; Pitzele, Barnett S.; and Jones, Peter H., to G. D. Searle & Co. Substituted 2-(3-aminophenoxymethyl)imidazolines. 4,523,020, Cl. 548-353.000.
Moran, Robert D., to United States of America, Navy. Apparatus for scanning a rotating gyroscope. 4,522,355, Cl. 244-3.200.
Morbark Industries, Inc.: *See*—
Morey, Norval K., 4,522,344, Cl. 241-79.000.
Morey, Norval K., to Morbark Industries, Inc. Wood chip screening and processing methods and apparatus. 4,522,344, Cl. 241-79.000.
Morgan, Clyde R. Bicycle handlebar grips. 4,522,083, Cl. 74-551.900.
Morgenschweis, Theo: *See*—
Utsch, Joachim; and Morgenschweis, Theo, 4,523,088, Cl. 235-487.000.
Mori, Kei. Artificial light source device. 4,523,257, Cl. 362-32.000.
Mori, Toshihiro, to NEC Corporation. Battery saver circuit for use with paging receiver. 4,523,332, Cl. 455-343.000.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo Kabushiki Kaisha. Semiconductor device. 4,523,211, Cl. 357-4.000.
Moriyama, Shigeo: *See*—
Suzuki, Takatoshi; Tachikawa, Hideo; and Moriyama, Shigeo, 4,522,660, Cl. 148-20.300.
Morris, George H.; and Nicholls, Douglas C., to Morris Rod Weeder Co. Ltd. Packer wheel. 4,522,268, Cl. 172-518.000.
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Morris, George H.; and Nicholls, Douglas C., 4,522,268, Cl. 172-518.000.
Morrison, Andrew D.; and Daud, Taher, to United States of America, National Aeronautics and Space Administration. Low defect, high purity crystalline layers grown by selective deposition. 4,522,661, Cl. 148-33.200.
Morrison, Bradley W., to Ogilvie Mills Ltd. Lactase-containing baking formulations. 4,522,832, Cl. 426-20.000.
Morse, Arthur L.: *See*—
Hewitt, Mary J.; and Morse, Arthur L., 4,523,326, Cl. 377-58.000.
Morse, James E.: *See*—
Kilroy, Eugene J.; Morse, James E.; Grimm, Thomas H.; and DeAnda, Nicholas, 4,522,607, Cl. 446-447.000.
Morse, John H.; and Skrynecki, Robert. Flexible safety belt with flashing light-emitting devices and alarm. 4,523,258, Cl. 362-108.000.
Morton Thiokol Inc.: *See*—
Bell, Frank H., 4,522,126, Cl. 102-370.000.
Moser, Mark D.: *See*—
Robinson, Delmar W.; Johnson, Russell W.; and Moser, Mark D., 4,522,935, Cl. 502-223.000.
Moss, Ernest K.: *See*—
Frentzel, Richard L.; and Moss, Ernest K., 4,522,877, Cl. 428-304.400.
Moss Rosenberg Verft A/S: *See*—
Schrader, Rolf F., 4,522,010, Cl. 52-745.000.
Mostek Corporation: *See*—
Johnson, Mark G., 4,523,110, Cl. 307-530.000.
Motorola, Inc.: *See*—
Peterson, Joe W., 4,523,107, Cl. 307-352.000.
Walczak, Thomas J.; Stone, Richard M.; and Cristiano, Gary M., 4,523,155, Cl. 330-279.000.
Mott, Ludwig: *See*—
Waniczek, Helmut; Bartl, Herbert; Hohmann, Gerhard; and Mott, Ludwig, 4,522,965, Cl. 524-109.000.
Mourao, Antonio M.; and Faist, Clifford H., to Texaco Inc. Diesel fuel containing rare earth metal and oxygenated compounds. 4,522,631, Cl. 44-57.000.
Mouri, Yasunori: *See*—
Amano, Matsuo; Sakamoto, Shinichi; Miki, Masayuki; Sasayama, Takao; Suda, Seiji; Mouri, Yasunori; and Ishii, Toshio, 4,523,284, Cl. 364-431.120.
Mowbray, Dorian F., to Lucas Industries plc. Fuel system for compression ignition engine. 4,522,182, Cl. 123-509.000.
Mowry, Donald E., to Don Mowry Flexo Parts, Inc. Conversion belt and stop plate assembly for upstacking corrugated box machinery. 4,522,617, Cl. 493-126.000.
MTU: *See*—
Dinger, Hans; Holzhauer, Hilbert; and Lang, Erberhard, 4,522,358, Cl. 244-110.00B.
Greune, Christian; and Kummeke, Heinrich, 4,522,025, Cl. 60-39.150.
Muanyagipari Kutato Intezet: *See*—
Kecskemethy, Geza; Kovacsay, Istvan; and Magdanyi, Laszlo , 4,522,963, Cl. 523-510.000.
Much, Joachim: *See*—
Cornils, Boy; Hibbel, Josef; Lieder, Bernhard; Much, Joachim; Schmidt, Volkmar; Wiebus, Ernst; and Konkol, Werner, 4,523,036, Cl. 568-454.000.
Mueller, Warren E.: *See*—
Seaburg, Paul A.; and Mueller, Warren E., 4,522,005, Cl. 52-544.000.
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, to Bayerische Motoren Werke AG. Service-interval display for motor vehicle and circuit for a display of this type. 4,523,283, Cl. 364-431.010.
Muhlemann, Hans R.; and Saxer, Ulrich P., to Lever Brothers Company. Oral compositions for hexetidine and zinc salts for the synergistic inhibition of dental plaque. 4,522,806, Cl. 424-52.000.
Mukai, Takamitsu: *See*—
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,522,567, Cl. 417-270.000.
Mulcahy, Joseph A., to J. Mulcahy Enterprises Incorporated. Continuous casting of steel. 4,522,249, Cl. 164-466.000.
Mullane, William E.: *See*—
Lund, David L.; Majumdar, Senajit J.; Mullane, William E.; and Krivanek, Louis, 4,523,068, Cl. 219-10.530.
Muller, Ludwig: *See*—
Adamowicz, Philippe; and Muller, Ludwig, 4,522,809, Cl. 424-89.000.

Multrus, Vladimir, to Honeywell GmbH. Diaphragm module for pneumatic control systems. 4,522,220, Cl. 137-85.000.
Munk, Werner G. Volume expanding beverage package. 4,522,332, Cl. 229-43.000.
Munschenborn, Dieter; and Rautenbach, Robert, to Nickel, Heinrich; and Eggeling, Ernst. Impact mill. 4,522,342, Cl. 241-57.000.
Murai, Toshimi: *See*—
Matsuoka, Hiroki; and Murai, Toshimi, 4,522,180, Cl. 123-489.000.
Murakami, Masatsugi: *See*—
Koebisu, Mamoru; Shinzawa, Masayuki; and Murakami, Masatsugi, 4,522,887, Cl. 428-461.000.
Murakami, Shigeomi: *See*—
Murakami, Yukihiro; Murakami, Shigeomi; and Maeda, Katsunosuke, 4,523,321, Cl. 373-110.000.
Murakami, Yukihiro; Murakami, Shigeomi; and Maeda, Katsunosuke, to Toray Industries, Inc. Vertical carbonizing furnace for use in the production of carbon fibers. 4,523,321, Cl. 373-110.000.
Muramatsu, Kiyohide: *See*—
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,522,909, Cl. 430-137.000.
Murarka, Shyam P.: *See*—
Levinstein, Hyman J.; Murarka, Shyam P.; and Williams, David S., 4,522,842, Cl. 427-8.000.
Murata Manufacturing Co., Ltd.: *See*—
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Murata, Michihiro; and Kumada, Akira, 4,523,142, Cl. 324-65.00R.
Murata, Michihiro; and Kitao, Shoichi, to Murata Manufacturing Co., Ltd. Dry/dew/frost sensor. 4,522,060, Cl. 73-336.500.
Murata, Michihiro; and Kumada, Akira, to Murata Manufacturing Co., Ltd. Apparatus for sensing dew and frost. 4,523,142, Cl. 324-65.00R.
Murayama, Seiichi: *See*—
Yasuda, Makoto; and Murayama, Seiichi, 4,523,096, Cl. 250-373.000.
Murray, John F., to Teleflora, Inc. Retainer for attaching floral lid container. 4,521,990, Cl. 47-41.120.
Murray, Ledell L., to General Indicator Corporation. Menu board frame and insert. 4,521,984, Cl. 40-576.000.
Murrell, Lawrence L.: *See*—
McVicker, Gary B.; Carter, James L.; Murrell, Lawrence L.; and Ziemiak, John J., 4,522,928, Cl. 502-26.000.
Musser, John H.; and Brown, Richard E., to USV Pharmaceutical Corporation. Certain 1,3-oxazolo[4,5H]quinolines useful as anti-allergy agents. 4,522,947, Cl. 514-293.000.
Musumiya, Raita; Sano, Hideo; Izichi, Yasuto; Inoue, Mitsuru; and Izawa, Kenzyu, to Honda Giken Kogyo Kabushiki Kaisha; and Fukuda Press Kogyo Kabushiki Kaisha. Pedal assist apparatus. 4,522,082, Cl. 74-512.000.
Mutzel, Wolfgang: *See*—
Gries, Heinz; and Mutzel, Wolfgang, 4,522,839, Cl. 426-548.000.
Mylander, Gerald D. Fill valve responsive to liquid level. 4,522,227, Cl. 137-393.000.
Nagamatsu, Henry T.: *See*—
Barnwell, Richard; Bushnell, Dennis; Nagamatsu, Henry T.; Bahi, Lakhdar; and Ross, Janet, 4,522,360, Cl. 244-204.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Gear crank apparatus for a bicycle. 4,522,610, Cl. 474-141.000.
Nagase, Masaomi: *See*—
Ogawa, Toshihisa; Miyagi, Hideo; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,522,168, Cl. 123-198.00D.
Nagatomo, Muneshige: *See*—
Koizumi, Hajime; Ohara, Shumpei; Kouda, Kiyoshi; Nagatomo, Muneshige; Sagara, Noriyasu; Togari, Satoshi; and Izumiyama, Hiroo, 4,522,254, Cl. 165-34.000.
Nagoya, Yoshinari: *See*—
Ochiai, Hideo; Nagoya, Yoshinari; Fujimoto, Ryoichi; Yamazaki, Susumu; Sasamoto, Nobuhiko; and Ishida, Shinichi, 4,522,040, Cl. 62-419.000.
Nakada, Akiyoshi: *See*—
Inoue, Toshitsugu; Nakada, Akiyoshi; Kaji, Haruo; Doi, Makoto; and Takezawa, Kuninori, 4,522,555, Cl. 414-733.000.
Nakagawa, Takao: *See*—
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Tsutsui, Toshio; Nakagawa, Takao; and Miwa, Shigeru, 4,522,627, Cl. 44-1.00R.
Nakajima, Hideki: *See*—
Sato, Jun; and Nakajima, Hideki, 4,522,354, Cl. 242-219.000.
Nakajima, Hidemasa; Okamura, Shozo; Sueyasu, Masanobu; Furujho, Sakae; Okane, Kohji; and Anezaki, Shoji, to Sumitomo Metal Industries, Ltd. Process for production of low phosphorus alloy. 4,522,650, Cl. 75-48.000.
Nakajima, Masahiro; and Hashimoto, Hiromi, to Nippon Electric Co., Ltd. Digital signal communication system for multi-level modulation including unique encoder and decoder. 4,523,323, Cl. 375-37.000.
Nakajima, Yosuke: *See*—
Hirose, Masataka; Kawajiri, Kazuhiro; and Nakajima, Yosuke, 4,523,214, Cl. 357-30.000.
Nakamura, Akira: *See*—
Kitagawa, Junji; Akita, Shigeyuki; Kasegawa, Norimichi; and Nakamura, Akira, 4,522,278, Cl. 180-79.100.
Nakamura, Kazuaki, to Aisin Seiki Kabushiki Kaisha. Stirling-cycle refrigerator. 4,522,032, Cl. 62-6.000.
Nakamura, Kazumasa: *See*—
Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, 4,523,281, Cl. 364-424.100.
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Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, 4,523,281, Cl. 364-424.100.
Nakano, Takuo: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,523,011, Cl. 544-238.000.
Nakate, Hiroshi; Kondo, Masatoshi; and Gosho, Nobuyuki, to Sumitomo Metal Industries, Ltd. Production of electrical resistance welded steel tubes with welds having improved toughness. 4,523,072, Cl. 219-67.000.
Nakayama, Kiyoshi: *See*—
Koguchi, Toshiro; Kase, Hiroshi; Kawamoto, Isao; Kassi, Masaji; Shirahata, Kunikatsu; Okachi, Ryo; and Nakayama, Kiyoshi, 4,522,812, Cl. 514-7.000.
Namba, Masaharu: *See*—
Kina, Hideki; Iijima, Toshiyuji; Tanabe, Eizo; Kazama, Toyoki; and Namba, Masaharu, 4,522,904, Cl. 430-54.000.
Napp Systems (USA), Inc.: *See*—
Hallman, Robert W., 4,522,910, Cl. 430-157.000.
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, to Fujitsu Limited. Process for preparing electrostatic developer. 4,522,909, Cl. 430-137.000.
National Distillers and Chemical Corporation: *See*—
Fayter, Richard G., Jr.; and Harris, Eugene G., 4,522,749, Cl. 252-522.00R.
Hall, Allen L.; and Fayter, Richard G., Jr., 4,522,950, Cl. 514-471.000.
Heimberg, Manfred, 4,522,998, Cl. 526-309.000.
Heimberg, Manfred, 4,522,999, Cl. 526-309.000.
National Semiconductor Corporation: *See*—
Sauer, Don R., 4,523,156, Cl. 330-282.000.
Naylor, Peter W.: *See*—
Phillips, Richard A.; and Naylor, Peter W., 4,523,173, Cl. 337-367.000.
NCR Canada Ltd - NCR Canada Ltee: *See*—
Cain, John D., 4,523,330, Cl. 382-7.000.
Mazumder, Ali T., 4,522,122, Cl. 101-93.020.
Therrien, Roger H., 4,523,231, Cl. 358-139.000.
NCR Corporation: *See*—
Lewis, Maurice W.; and Lakes, Stephen D., 4,523,207, Cl. 346-214.000.
Schnathorst, Vernon K., 4,523,277, Cl. 364-200.000.
NEC Corporation: *See*—
Mori, Toshihiro, 4,523,332, Cl. 455-343.000.
Takahashi, Sadayuki; Yonezawa, Masatomo; Ochi, Atsushi; Yano, Takeshi; Hamatsuki, Takeshige; and Fukui, Izumu, 4,523,121, Cl. 310-334.000.
Neefe, Charles W. Vapor phase hydrogen generator. 4,522,695, Cl. 204-266.000.
Neese, Gerhard, to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien. Roller bearing support structure with metal window cage. 4,522,516, Cl. 384-572.000.
Neff, James A., to Mac Valves, Inc. Valve spool. 4,522,374, Cl. 251-356.000.
Neilson, James M.: *See*—
Taylor, Thomas V.; and Neilson, James M., 4,522,205, Cl. 128-303.170.
Neilson, Robert H.; and Wisian-Neilson, Patty J. Polyphosphazene compounds and method of preparation. 4,523,009, Cl. 528-399.000.
Neis, Thomas W.; and Swartz, Harold L., to Sperry Corporation. Temperature stable arcuate bubble gravity sensor mount. 4,521,974, Cl. 33-379.000.
Nelson, Alexander. Toothpick dispenser. 4,522,314, Cl. 221-190.000.
Nelson, Arthur R., to Aetna Telecommunications Laboratories. Fiber optic sensors for simultaneously detecting different parameters in a single sensing tip. 4,523,092, Cl. 250-227.000.
Nelson, Dale H., to Prime Computer, Inc. AC to DC conversion system with current spreading circuit. 4,523,266, Cl. 363-26.000.
Nelson, John F., to Illinois Tool Works, Inc. Wiper motor mounting grommet. 4,522,378, Cl. 267-141.400.
Nelson, Leon F.; Montgomery, Dan T.; Wyffels, Michael K.; and Sikula, William J., Jr., to Deere & Company. Combine power boost system. 4,522,553, Cl. 414-526.000.
Nelson, Rodney C., to Bemis Company, Inc. Bag inserter machine. 4,522,012, Cl. 53-175.000.
Nemoto, Shigeru; Kitajima, Goro ; Saitou, Sinichi; and Osada, Hazime, to Olympus Optical Co., Ltd. Signal detection operating lever device of magnetic recording tape reproducing apparatus. 4,523,247, Cl. 360-137.000.
Neukam, Theo; Brauer, Wolfgang; and Korte, Siegfried, to Bayer Aktiengesellschaft. Process for the production of α, β-unsaturated carboxylic acid alkyl esters sulfonated in the α-position and compounds obtainable by this process. 4,522,764, Cl. 260-456.00R.
Neumann, Don B., to Excellon Industries. Scanning beam reference and read system. 4,523,093, Cl. 250-234.000.
Neumeier, Gunter F.: *See*—
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.
Neuschaffer, Karl-Heinz; Engels, Hans-Werner; Gebert, Hans-Jurgen; Laube, Robert W.; and Zoche, Gunter, to Dynamit Nobel Aktien-

gesellschaft. Machine base and process for manufacture thereof. 4,522,652, Cl. 106-84.000.
Neuzil, Richard W.: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,522,761, Cl. 260-419.000.
New Draulics, Inc.: *See*—
Lind, Michael A.; and Dunn, Michael R., 4,521,963, Cl. 30-92.000.
NGK Insulators, Ltd.: *See*—
Ogawa, Yutaka; Takeuchi, Tsunezo; and Otaka, Masashi, 4,522,668, Cl. 156-89.000.
Nguyen-Dinh, Xuan: *See*—
Gigliotti, Michael F. X., Jr.; Yang, Swe-Wong; Jackson, Melvin R.; Bruch, Charles A.; and Nguyen-Dinh, Xuan, 4,522,664, Cl. 148-404.000.
Nguyen, Minh-Tri. Switching electronic ignition. 4,522,185, Cl. 123-637.000.
Nibby, Chester M., Jr.; Goldin, Reeni; and Andrews, Timothy A., to Honeywell Information Systems Inc. Partial defective chip memory support system. 4,523,313, Cl. 371-10.000.
Nicholas, David M., to Air Products and Chemicals, Inc. Nitrogen and phosphorus removal from wastewater. 4,522,722, Cl. 210-605.000.
Nicholas, John D., to Elastomer Seals, Inc. Pavement joint seal with chevron-shaped walls. 4,522,413, Cl. 277-205.000.
Nicholls, Douglas C.: *See*—
Morris, George H.; and Nicholls, Douglas C., 4,522,268, Cl. 172-518.000.
Nickel, Heinrich: *See*—
Munschenborn, Dieter; and Rautenbach, Robert, 4,522,342, Cl. 241-57.000.
Nihon Kohden Corporation: *See*—
Kurahashi, Muneshige; and Yamamori, Shinji, 4,522,204, Cl. 128-719.000.
Nihon Schumacher K.K.: *See*—
Kuwajima, Soichi; and Sakamoto, Naojiro, 4,522,719, Cl. 210-457.000.
Niida, Chiaki: *See*—
Kamifuji, Hiroshi; Ito, Tomoo; and Niida, Chiaki, 4,522,175, Cl. 123-339.000.
Niiho, Masaaki; and Itagaki, Takuo, to Asahi Kogaku K.K.K. Averaging circuit. 4,523,108, Cl. 307-353.000.
Nikolich, Milovan, to Signode Corporation. Portable gas-powered tool with linear motor. 4,522,162, Cl. 123-46.50C.
Ninomiya, Ken; Suzuki, Keizo; and Nishimatsu, Shigeru, to Hitachi, Ltd. Surface treatment apparatus. 4,522,674, Cl. 156-345.000.
Nippon Electric Co., Ltd.: *See*—
Hibiya, Taketoshi; Ohta, Yoshinori; and Matsumi, Koichi, 4,522,473, Cl. 350-377.000.
Nakajima, Masahiro; and Hashimoto, Hiromi, 4,523,323, Cl. 375-37.000.
Nippon Kogaku K. K.: *See*—
Sato, Yu, 4,523,157, Cl. 331-4.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Hasebe, Nobuhisa; Kawada, Hiroshi; Yokoyama, Naoki; and Komori, Shigeki, 4,522,540, Cl. 409-293.000.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kanzaka, Yoshihiro, 4,521,943, Cl. 24-689.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,522,966, Cl. 524-114.000.
Nippon Soken, Inc.: *See*—
Kawai, Hisasi; Ina, Toshikazu; Igashira, Toshihiko; Nomura, Ken; Yoshida, Masakazu; Komoda, Takao; and Hamanishi, Makio, 4,522,177, Cl. 123-478.000.
Kitagawa, Junji; Akita, Shigeyuki; Kasegawa, Norimichi; and Nakamura, Akira, 4,522,278, Cl. 180-79.100.
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,523,195, Cl. 340-870.370.
Nippon Steel Corporation: *See*—
Shindow, Yoshio; Tsutsumi, Masaya; Hotta, Wataru; and Miyauchi, Yujiro, 4,522,892, Cl. 428-628.000.
Nippondenso Co., Ltd.: *See*—
Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, 4,523,281, Cl. 364-424.100.
Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuji, 4,522,176, Cl. 123-339.000.
Yano, Kiyotoshi; Suzuki, Yutaka; and Yamada, Yoshichika, 4,522,372, Cl. 251-141.000.
Nishi, Yoshio: *See*—
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Nishida, Takashi: *See*—
Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,523,024, Cl. 549-407.000.
Nishikawa, Ikuo, to Kabushiki Kaisha Universal. Device for generating impact sound for slot machine. 4,522,399, Cl. 273-143.00R.
Nishikawa, Masaji; Takagi, Takeji; and Ueki, Masao, to Olympus Optical Co., Ltd. Elastomer member with non-tacky surface treating layer and method of manufacturing same. 4,522,866, Cl. 428-216.000.
Nishimatsu, Shigeru: *See*—
Ninomiya, Ken; Suzuki, Keizo; and Nishimatsu, Shigeru, 4,522,674, Cl. 156-345.000.
Nishimura, Hirofumi; Oda, Hiroyuki; Kaneko, Tadashi; Takai, Akira; and Takeuchi, Nobuo, to Mazda Motor Corporation. Engine speed detecting system for multiple-displacement engine. 4,522,179, Cl. 123-481.000.
Nishina, Takashi: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,523,011, Cl. 544-238.000.
Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Adapter lens system for use with photographic cameras. 4,522,471, Cl. 350-449.000.
Nishioka, Youiti: *See*—
Katsuki, Kosuke; Nishioka, Youiti; and Nomura, Susumu, 4,521,931, Cl. 8-149.200.
Nissan Motor Company, Limited: *See*—
Hasegawa, Yoji; and Shinzawa, Motohiro, 4,522,027, Cl. 60-274.000.
Hasegawa, Yoji; and Shinzawa, Motohiro, 4,522,028, Cl. 60-277.000.
Matsuno, Yoshio, 4,522,114, Cl. 98-2.090.
Ogawa, Naoki, 4,522,165, Cl. 123-195.00C.
Yoshida, Kenji; and Sanada, Yuichi, 4,522,419, Cl. 280-96.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,522,108, Cl. 91-376.00R.
Nitro Nobel AB: *See*—
Jerberyd, Leif, 4,522,129, Cl. 104-138.00G.
Nitto Electric Industrial Co., Ltd.: *See*—
Funakoshi, Keigo; and Ametani, Minoru, 4,522,679, Cl. 156-510.000.
Nitzberg, Leonard R. Method and apparatus for reclamation by reducing highwalls to gradable rubble at augered or longwalled mining sites. 4,522,448, Cl. 299-13.000.
Niva, Karl-Erik, to Kiruna Truck AB. Transport vehicle for a slag receptacle. 4,522,549, Cl. 414-474.000.
Niven, Benjamin F., Jr., to R. J. Reynolds Tobacco Company. Dicing apparatus for sheet material. 4,522,096, Cl. 83-408.000.
Nixdorf Computer AG: *See*—
Roeschlein, Rolf, 4,521,961, Cl. 29-884.000.
Noack, Timothy J.; and Rathie, Lester C., to Otis Engineering Corporation. Valve. 4,522,370, Cl. 251-63.500.
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Bethea, James R., 4,522,855, Cl. 428-49.000.
Nocopi Inc.: *See*—
Gardner, Norman A.; and Voticky, Michael P., 4,522,429, Cl. 283-91.000.
Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Automatic transmission controller for automobiles. 4,523,281, Cl. 364-424.100.
Noma, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron beam exposure apparatus. 4,523,098, Cl. 250-492.200.
Noma, Toshiyuki: *See*—
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Nomura, Hiroshi, to Diesel Kiki Co., Ltd. Swash-plate type compressor having improved lubrication of swash plate and shoes. 4,522,112, Cl. 92-71.000.
Nomura, Ken: *See*—
Kawai, Hisasi; Ina, Toshikazu; Igashira, Toshihiko; Nomura, Ken; Yoshida, Masakazu; Komoda, Takao; and Hamanishi, Makio, 4,522,177, Cl. 123-478.000.
Nomura, Susumu: *See*—
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Ugon, Michel; and Nonat, Jean-Pierre, 4,523,297, Cl. 364-900.000.
Nonnenmann, Manfred; Oltmanns, Heinrich; and Hohhausel, Manfred, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Method for manufacturing a catalytic reactor carrier matrix. 4,521,947, Cl. 29-157.00R.
Nonomura, Arthur M.; and Pappo, Raphael, to Pappo, Raphael. Composition of matter from *Cryptosiphonia woodii* useful for the treatment of herpes simplex virus. 4,522,814, Cl. 514-54.000.
Nordin, Olof; and Forsberg, Soren, to Forsheda AB. Combination mould portion and protective element for pipe. 4,522,669, Cl. 156-157.000.
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Begg, Geoffrey S., 4,523,187, Cl. 340-661.000.
Normann, Nils A., to Baylor College of Medicine. Method and an apparatus for intra-aortic balloon monitoring and leak detection. 4,522,194, Cl. 128-1.00D.
Norris, Frank A.; and Krile, David J., to United States of America, Air Force. Switch debounce circuit. 4,523,104, Cl. 307-247.00A.
North American Philips Corporation: *See*—
Liebert, Richard B.; and White, Roger P., 4,522,472, Cl. 350-362.000.
North American Systems, Inc.: *See*—
Weinberger, Royal, 4,522,298, Cl. 206-216.000.
Northern Telecom Limited: *See*—
Hogeboom, John G., 4,523,150, Cl. 328-133.000.
Shannon, Michael A., 4,522,501, Cl. 366-142.000.
Northland Aluminum Products, Inc.: *See*—
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Northrop Corporation: *See*—
Stappaerts, Eddy A., 4,523,320, Cl. 372-87.000.
Northwestern University: *See*—
Chatterton, Robert T., Jr., 4,522,831, Cl. 514-169.000.

Norwich Eaton Pharmaceuticals, Inc.: *See*—
Fox, Charles L., Jr.; and Modak, Shanta M., 4,522,819, Cl. 514-187.000.

Novak, Vaclav; Prusek, Jaroslav; and Trojan, Vaclav, to Statni Vyzkumny Ustav Ochrany Materialu G.V. Indicator terminal for coulometric measuring devices. 4,522,699, Cl. 204-434.000.

Novy, Robert A.: *See*—
Weimer, Ralph E.; Kalowski, Thaddeus J.; and Novy, Robert A., 4,522,117, Cl. 99-348.000.

Nozue, Shigehiro; and Fukuoka, Tatsuhiko, to Taiho Kogyo Co., Ltd. Tapered-land thrust bearing device. 4,522,513, Cl. 384-368.000.

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Nussbaumer, Dietmar; Perl, Horst; and Vinh, Khuong T., to Sartorius GmbH. Apparatus for static membrane filtration. 4,522,713, Cl. 210-136.000.

Nuti, Marianna: *See*—
Schlom, Jeffery; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,522,918, Cl. 435-68.000.

Nutt, Ruth F., to Merck & Co., Inc. Cyclic hexapeptide somatostatin analogs. 4,522,813, Cl. 424-177.000.

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Oakley, Charles B.: *See*—
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O'Brien, Larry S.; and Kaler, Ward S., to Leco Corporation. Ash fusion system. 4,522,787, Cl. 422-78.000.

O'Brien, Robert E.: *See*—
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Ochi, Atsushi: *See*—
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Ochiai, Hideo; Nagoya, Yoshinari; Fujimoto, Ryoichi; Yamazaki, Susumu; Sasamoto, Nobuhiko; and Ishida, Shinichi, to Hitachi, Ltd. Refrigerator. 4,522,040, Cl. 62-419.000.

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O'Connor, James M.; Kraus, Theodore C.; and Schnabel, Wilhelm J., to Olin Corporation. Select NCO-terminated, uretdione group-containing polyurethane prepolymers and lignocellulosic composite materials prepared therefrom. 4,522,975, Cl. 524-702.000.

Octel S.A.: *See*—
Rodde, Christian; and Desarnaud, Jean, 4,522,059, Cl. 73-223.000.

Oda, Hiroyuki: *See*—
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Odaka, Kentaro: *See*—
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Oehlert, James A. Interlocking building panel. 4,522,007, Cl. 52-588.000.

Oertel, Richard W., III; Richter, Reinhard H.; and Tucker, Benjamin W., to Upjohn Company, The. Diisocyanate. 4,522,762, Cl. 260-453.00A.

Oestrich, Michael: *See*—
Yates, Donald N., Jr.; and Oestrich, Michael, 4,522,665, Cl. 149-21.000.

Oetiker, Hans. Hose clamp. 4,521,940, Cl. 24-282.000.

Oetting, William A.: *See*—
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Officine Meccaniche Pavesi & C. S.p.A.: *See*—
Barrera, Giorgio, 4,521,958, Cl. 29-734.000.

Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Method for producing crystals. 4,522,680, Cl. 156-624.000.

Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo. Amorphous silicon photoconductive member with interface and rectifying layers. 4,522,905, Cl. 430-60.000.

Ogawa, Naoki, to Nissan Motor Company, Limited. Noise reducing cover for an internal combustion engine. 4,522,165, Cl. 123-195.00C.

Ogawa, Toshihisa; Miyagi, Hideo; Nagase, Masaomi; and Matsuno, Kiyotaka, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling fuel-injection amount in diesel engine. 4,522,168, Cl. 123-198.00D.

Ogawa, Yuji, to Olympus Optical Co., Ltd. Sample delivering method for use in automatic chemical analysis. 4,522,921, Cl. 436-47.000.

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Ogilvie Mills Ltd.: *See*—
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Oguma, Noboru: *See*—
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Ohkata, Ichizo, to Kato Hatsujo Kaisha Ltd. Freeze preventing valve. 4,522,219, Cl. 137-62.000.

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Ohmuro, Masaru: *See*—
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Ohno, Syotaro: *See*—
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Ohta, Hiroshi: *See*—
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Ohuchi, Shigehiro; and Kataoka, Masao, to Toray Industries, Inc. Neutron-shielding fabric and composite fiber and method of manufacture thereof. 4,522,868, Cl. 428-224.000.

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Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,522,994, Cl. 526-351.000.

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Okamoto, Yoshiyuki; and Hwang, Edward F., to W. R. Grace & Co. Electrically conductive poly(β-diketone) and process therefor. 4,522,746, Cl. 252-500.000.

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Oki, Kenichi: *See*—
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Orth, Charles D., to Singer Company, The. Automotive air conditioning system controlled by damped pressure switch. 4,523,066, Cl. 200-83.00S.
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Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal diphenyl ethers, their preparation and their use as herbicides. 4,523,034, Cl. 564-79.000.
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Patel, Pravin K. Process of preparing a recording member having a variable thickness recording layer. 4,522,848, Cl. 427-131.000.
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Billet, Reinhard; Kober, Rainer; Mackowiak, Jerzy; and Geipel, Werner, 4,522,767, Cl. 261-94.000.
Paul Revere Corporation, The: *See*—
Rieke, David M., 4,522,296, Cl. 198-548.000.
Payne, Fred A., to R & D Associates. Optical vernier positioning for robot arm. 4,523,100, Cl. 250-561.000.
Peabody Noise Control, Inc.: *See*—
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Peavey Electronics Corp.: *See—*
Peavey, Hartley D.; and Powers, Michael V., 4,522,101, Cl. 84-1.160.

Peavey, Hartley D.; and Powers, Michael V., to Peavey Electronics Corp. Mounting ring and thumbrest. 4,522,101, Cl. 84-1.160.

Peckham, George W. Hopper car gate opener and method of operating a hopper car gate. 4,522,545, Cl. 414-376.000.

Peddle, Darren C., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Adjustable jig assembly. 4,522,380, Cl. 269-71.000.

Pedersen, Niels C., to University of California, The Regents of the. Feline calicivirus vaccine. 4,522,810, Cl. 424-89.000.

Peery, John R.; and Eckenhoff, James B., to ALZA Corporation. Multiple fluid pulse dispenser. 4,522,622, Cl. 604-191.000.

Peiffer, Dennis G.; and Lundberg, Robert D., to Exxon Research & Engineering Co. Controlled gelation on nonaqueous solutions containing low charge density polyampholytes. 4,522,960, Cl. 523-339.000.

Pellon Corporation: *See—*
Bregatta, Ray J., 4,521,921, Cl. 2-93.000.

Pelzner, Roger B.: *See—*
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Pendse, Anil D.: *See—*
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Pennwalt Corporation: *See—*
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Pentel Kabushiki Kaisha: *See—*
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Perkins, Thomas K., to Atlantic Richfield Company. Single well electrical oil stimulation. 4,522,262, Cl. 166-248.000.

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Pernicone, Nicola: *See—*
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Persyk, Dennis E., to Siemens Gammasonics, Inc. Radiation detecting apparatus with reduced magnetic field sensitivity. 4,523,091, Cl. 250-213.0VT.

Peters, Edward N., to General Electric Company. Polyetherimides of di(phthalic anhydride) derivatives of di(substituted phenol) sulfones. 4,523,006, Cl. 528-172.000.

Peters, Rex B., to Sundstrand Data Control, Inc. Digital processor for use with an accelerometer based angular rate sensor. 4,522,062, Cl. 73-505.000.

Petersen, Richard W.; Pierini, John M.; and Yeo, Herbert G., to Augat Inc. Electrical connector programming tool. 4,522,053, Cl. 720-316.000.

Peterson, Gudmundur P.; and d'Anjou, Daniel, to Pratt & Whitney Canada Inc. Power/torque limiter unit for free turbine type engines. 4,522,026, Cl. 60-39.281.

Peterson, Joe W., to Motorola, Inc. Switched capacitor comparator. 4,523,107, Cl. 307-352.000.

Peterson Laboratories: *See—*
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Peterson, William, to Peterson Laboratories. Method and apparatus for making corrected custom foot molds. 4,522,777, Cl. 264-223.000.

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Pettibone, Donald W.: *See—*
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Lum, Genevieve S.; Li, Hsueh M.; and Pettigrew, F. Alexander, 4,522,798, Cl. 423-300.000.

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Pfost, Dale R., to Brown University. Laser tape systems. 4,523,319, Cl. 372-54.000.

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Phillips, James D., to J. D. Phillips Corporation. Adjustable cam bar assembly. 4,522,189, Cl. 125-11.0TP.

Phillips Petroleum Company: *See—*
Aldag, Arthur W., Jr.; and Gardner, Lloyd E., 4,522,709, Cl. 208-216.00R.

Hill, H. Wayne, Jr.; and Reed, Jerry O., 4,522,867, Cl. 428-220.000.

Kukes, Simon G.; and Battiste, David R., 4,522,702, Cl. 208-89.000.

Phillips, Richard A.; and Naylor, Peter W., to Otter Controls Limited. Electric switches. 4,523,173, Cl. 337-367.000.

Phoenix Manufacturing, Inc.: *See—*
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Piasecki, Joshua; Zelinkovsky, Reuven; Segev, Aharon; and Henquin, Teodor, to Electronics Corporation of Israel, Ltd. Time assignment speech interpolation apparatus. 4,523,309, Cl. 370-81.000.

Pickens, Ralph D. Semi-automatic cartridge reloading machine. 4,522,102, Cl. 86-27.000.

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Pilboue, Pierre, to Trefileries et Cableries Chiers-Chatillon-Gorcy. Apparatus for winding wire net with simple twist. 4,522,345, Cl. 242-55.000.

Pilkington Brothers p.l.c.: *See—*
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Pinkham, Thomas A.: *See—*
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Pioneer Electronic Corporation: *See—*
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Piorr, Robert: *See—*
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Pirooz, Perry P., to Owens-Illinois, Inc. Sealing glass and method of making a Willemite filler therefor. 4,522,925, Cl. 501-15.000.

Pitel, Ira J., to Cornell Dubilier Electronics. Modular lighting control with circulating inductor. 4,523,129, Cl. 315-291.000.

Pitel, Ira J., to Cornell Dubilier Electronics Inc. Four lamp modular lighting control. 4,523,130, Cl. 315-291.000.

Pitney Bowes Inc.: *See—*
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Pitzele, Barnett S.: *See—*
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Plastic Specialties and Technologies, Inc.: *See—*
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Plessey Overseas Limited: *See—*
Whatmore, Roger W.; and Young, Iain M., 4,523,119, Cl. 310-313.00A.

Pletcher, Erwin C. Ring for orthodontic bracket. 4,522,590, Cl. 433-15.000.

Plikuhn, Keith A. Drum and drum body formed from adhered, solid blocks of wood. 4,522,006, Cl. 52-585.000.

Plough, Inc.: *See—*
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Ploussios, George. Waveguide polarizer having conductive and dielectric loading slabs to alter polarization of waves. 4,523,160, Cl. 333-21.00A.

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Podiak, Richard S.: *See—*
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Pohl, Fritz: *See—*
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Pohl, Peter. Torque wrench. 4,522,075, Cl. 73-862.230.

Poister, Clarence E. Dough roller and shaper device for pie crusts and the like. 4,522,580, Cl. 425-193.000.

Polaroid Corporation: *See—*
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Polinski, Stanley F.: *See—*
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Poll, Robert F.: *See—*
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Pollock, Charles. Stacking chair. 4,522,444, Cl. 297-239.000.

Polysar Limited: *See—*
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Pommez, Philippe J. Absorbent article structure and absorbent article. 4,522,874, Cl. 428-284.000.
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Poss, Richard F.: *See*—
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Minderhoud, Johannes K.; and Post, Martin F. M., 4,522,939, Cl. 502-242.000.
Postman, William: *See*—
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Power Pry Corporation: *See*—
Wilson, Randall J.; and Wilson, Bruce C., 4,522,054, Cl. 72-392.000.
Powers, Michael V.: *See*—
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Pratt & Whitney Canada Inc.: *See*—
Peterson, Gudmundur P.; and d'Anjou, Daniel, 4,522,026, Cl. 60-39.281.
Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J., to United States of America, Navy. Method and apparatus for coating submerged portions of floating structures. 4,522,882, Cl. 428-351.000.
Press, Irving D., to UMC Industries, Inc. Components for lined piping system with anchored liners and method of manufacture. 4,522,432, Cl. 285-55.000.
Presto Lock, Inc.: *See*—
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Price, Frank C. Thermal conditioning of material in containers. 4,522,586, Cl. 432-11.000.
Primages, Inc.: *See*—
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Prime Computer, Inc.: *See*—
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Progress Equities Incorporated: *See*—
Berry, W. Wess; Schmeda, Rae A.; and Kibler, Holly S., 4,522,726, Cl. 210-660.000.
Progressive Machinery Sales, Inc.: *See*—
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Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., to Franklin Institute, The. Reagent and method for decomposing organosulfur compounds. 4,523,043, Cl. 568-840.000.
Queener, Carl A.: *See*—
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Quinlan, Patrick M., to Petrolite Corporation. Use of quaternized derivatives of polymerized pyridines and quinolines as microbiocides. 4,522,643, Cl. 71-67.000.
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Rademaker, Leo C.; Hopkinson, Philip J.; Bell, Gordon M.; and Hay, Noah D., to General Electric Company. Method for making a dry type transformer. 4,521,954, Cl. 29-605.000.
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Rohatgi, Ajeet; Rai-Choudhury, Prosenjit; Gigante, Joseph R.; Singh, Ranbir; and Fonash, Stephen J., 4,522,657, Cl. 148-1.500.
Raineri, Giuseppe, to Pietro Laverda S.p.A. Combine harvesters. 4,522,552, Cl. 414-523.000.
Rajchman, Jan. Electronic microcopier apparatus. 4,523,235, Cl. 358-256.000.
Ramamurthy, Arakalgud V., to Union Carbide Corporation. Process for substantially eliminating surface melt fracture when extruding ethylene polymers. 4,522,776, Cl. 264-176.00R.
Ramsden, Hugh E., to J. T. Baker Chemical Company. Diazonium affinity matrixes. 4,522,724, Cl. 210-635.000.
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Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., 4,522,846, Cl. 427-54.100.
Randall, James C.: *See*—
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Rao, S. Prabhakara; Brothers, Lance E.; and Brake, Bobby G., to Halliburton Company. Salt cement dispersant and method of using same in cementing subterranean wellbore. 4,522,653, Cl. 106-90.000.
Rapp, Karl G., to United Industries Sales Organization, Inc. Closure cap for multi-compartment containers. 4,522,315, Cl. 222-142.100.
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Rathgeber, Juergen; and Ward, William W., to Southern Case, Inc. Container and associated latch structure. 4,522,312, Cl. 220-324.000.
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Raubenheimer, Johann N., to Johann Nicolaas Raubenheimer. Random steering device for a submerged suction cleaning head. 4,521,933, Cl. 15-1.700.
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Raytheon Company: *See*—
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Botez, Dan, 4,523,317, Cl. 372-45.000.
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Prusak, John J., 4,522,659, Cl. 148-11.50R.
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tures of 1-decyloxy-4-(7-oxa-4-octinyl)-oxy-benzene and propargite. 4,522,825, Cl. 514-517.000.

Reid, Albert R.: *See—*
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Reimert, Larry E., to Dril-Quip, Inc. Self-aligning connector assembly. 4,522,431, Cl. 285-27.000.

Reinhardt, Erich; and Erhardt, Rainer, to Prof. Dr.-Ing. Werner H. Bloss. Method of automatic detection of cells and determination of cell features from cytological smear preparations. 4,523,278, Cl. 364-413.000.

Reliance Electric Company: *See—*
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Fisher, Thomas M., 4,523,056, Cl. 179-81.00R.

Remington, Richard C., to Presto Lock, Inc. Bistable electromagnetic latch. 4,523,167, Cl. 335-230.000.

Remy, David C.; and Clineschmidt, Bradley V., to Merck & Co., Inc. Anti-emetic esters of cyproheptadine-3-carboxylic acid and structurally related compounds. 4,522,821, Cl. 514-320.000.

Renold, Walter. Motion picture film gate and registration system. 4,522,476, Cl. 352-225.000.

Rensselaer Polytechnic Institute: *See—*
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Restaurant Technology, Inc.: *See—*
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Reyes, Peter A.; and Finney, Robert H., to Bell Helicopter Textron, Inc. Elastomeric system for mounting a helicopter rotor. 4,522,563, Cl. 416-134.00A.

Rhone-Poulenc Chimie de Base: *See—*
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Ricoh Company, Ltd.: *See—*
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Kanmoto, Yoshiaki, 4,523,229, Cl. 358-163.000.

Rieke, David M., to Paul Revere Corporation, The. Flail auger for semi-liquid manure spreader. 4,522,296, Cl. 198-548.000.

Rigoli, Robert: *See—*
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Rihs, Grety: *See—*
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Ringer, Karl. Container-handling system with rail/rail and road/rail transfer. 4,522,546, Cl. 414-343.000.

Ringle, Richard P.: *See—*
Connolly, John D., Jr.; Gallivan, Timothy J.; and Ringle, Richard P., 4,522,769, Cl. 264-0.500.

Ringspann Albrecht Maurer K.G.: *See—*
Giese, Emil; Maurer, Ruprecht; and Hagen, Max, 4,522,289, Cl. 192-41.00A.

RIS Irrigation Systems: *See—*
Costa, Robert B., 4,522,339, Cl. 239-272.000.

Riseman, Jacob, to International Business Machines Corporation. Method of making integrated circuits using metal silicide contacts. 4,521,952, Cl. 29-590.000.

Rius, Jean M.: *See—*
Baciu, Antoine; Rius, Jean M.; and Sivry, Bernard, 4,522,778, Cl. 264-328.700.

Rivereau, Alain: *See—*
Martin, Madeleine; Lesage, Jean; Courbin, Gerard; and Rivereau, Alain, 4,522,878, Cl. 428-313.700.

Riviana Foods Inc.: *See—*
Meinardus, Elmond F., 4,522,837, Cl. 426-482.000.

RK Chemical Company Limited: *See—*
Kerchiss, Roman R., 4,522,057, Cl. 73-150.00R.

Robert Bosch GmbH: *See—*
Babitzka, Rudolf; and Linder, Ernst, 4,522,174, Cl. 123-300.000.
Burger, Kurt; and Gruner, Heiko, 4,522,067, Cl. 73-862.650.
Falk, Gerhard, 4,522,352, Cl. 242-193.000.
Greiner, Max; and Konrath, Karl, 4,522,181, Cl. 123-502.000.
Grunwald, Werner; Pfizenmaier, Heinz; de la Prieta, Claudio; Schmid, Kurt; and Schmidt, Ewald, 4,522,671, Cl. 156-235.000.

Robich, James M.: *See—*
Thomas, Samuel J.; Robich, James M.; and Hayes, Robert L., 4,523,141, Cl. 324-54.000.

Robinson, Chris E., to Figgie International. On-board flap opener. 4,522,014, Cl. 53-382.000.

Robinson, Delmar W.; Johnson, Russell W.; and Moser, Mark D., to UOP Inc. Platinum and indium-containing catalyst for reforming hydrocarbons. 4,522,935, Cl. 502-223.000.

Robinson, Don M.: *See—*
Swenson, Robert E.; Sasscer, Lawrence D.; and Robinson, Don M., 4,523,275, Cl. 364-200.000.

Robinson, Earl F.: *See—*
Bare, Rex O.; and Robinson, Earl F., 4,522,211, Cl. 128-640.000.

Robinson, Eric, to Rigoli, Robert. Device for feeding invalids. 4,522,543, Cl. 414-9.000.

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Clapper, Robert L.; Gradle, Richard J.; and Bake, Earl A., 4,522,230, Cl. 137-496.000.
Schack, Carl J.; and Flanagan, Joseph E., 4,522,756, Cl. 260-349.000.
Soclof, Sidney I., 4,522,682, Cl. 156-647.000.
Tocci, Leonard R., 4,523,300, Cl. 365-43.000.

Rodde, Christian; and Desarnaud, Jean, to Octel S.A. Flowmeter and installation for mixing an additive in a liquid. 4,522,059, Cl. 73-223.000.

Roeschlein, Rolf, to Nixdorf Computer AG. Method for the manufacture of a multi-polar contact strip. 4,521,961, Cl. 29-884.000.

Rogers, Donald G., to Sprague Electric Company. Cathode for an electrolytic capacitor. 4,523,255, Cl. 361-433.000.

Rogers, Richard B.: *See—*
Arndt, Kim E.; Rogers, Richard B.; and McCormick, Ronald W., 4,522,642, Cl. 71-11.000.

Rohatgi, Ajeet; Rai-Choudhury, Prosenjit; Gigante, Joseph R.; Singh, Ranbir; and Fonash, Stephen J., to Westinghouse Electric Corp. Low temperature process for annealing shallow implanted N+/P junctions. 4,522,657, Cl. 148-1.500.

Rohm and Haas Company: *See—*
Kelley, Everett J., 4,523,028, Cl. 560-199.000.

Rohr Industries, Inc.: *See—*
Blair, Winford, 4,522,859, Cl. 428-116.000.

Rolls-Royce Limited: *See—*
Smith, Michael J. T., 4,522,283, Cl. 181-175.000.

Romani, Gian L.: *See—*
D'Angelo, Silvano; Modena, Ivo; and Romani, Gian L., 4,523,147, Cl. 324-248.000.

Roscrow, Harold N.; Ewer, Ronald W.; and Squires, Philip H., to Sola Products Limited. Casting gasket assembly and method for casting lenses therefrom. 4,522,768, Cl. 264-2.200.

Rose, William H., to AMP Incorporated. Snap action switch. 4,523,064, Cl. 200-67.00D.

Rosemount Inc.: *See—*
Hagen, Floyd W., 4,522,070, Cl. 73-384.000.

Rosencwaig, Allan; and Opsal, Jon, to Therma-Wave, Inc. Thin film thickness measurement with thermal waves. 4,522,510, Cl. 374-7.000.

Rosin, Michael L.: *See—*
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,522,969, Cl. 524-425.000.

Ross, Alan B. Method and apparatus for adapting photographic enlargers for use with large format negatives. 4,522,490, Cl. 355-75.000.

Ross, Janet: *See—*
Barnwell, Richard; Bushnell, Dennis; Nagamatsu, Henry T.; Bahi, Lakhdar; and Ross, Janet, 4,522,360, Cl. 244-204.000.

Ross, Julian R. H.: *See—*
Sambrook, Rodney M.; and Ross, Julian R. H., 4,522,940, Cl. 502-328.000.

Rossmann, Christian: *See—*
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,522,740, Cl. 252-174.210.

Rossow, Eberhard, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Evaluation device for electron-optical images. 4,523,094, Cl. 250-311.000.

Rosthauser, James W., to Mobay Chemical Corporation. Process for coating aqueous dispersion of epoxy resin and blocked polyisocyanate containing chemically incorporated anionic hydrophilic groups. 4,522,851, Cl. 427-386.000.

Rosthauser, James W.: *See—*
Chung, James Y. J.; and Rosthauser, James W., 4,522,979, Cl. 525-66.000.

Roth, Albert. Zoned intrusion display with series-connected sensors. 4,523,185, Cl. 340-524.000.

Rotondo, Philip L.; and Rotondo, Thomas J. Apparatus for making reinforced concrete products. 4,522,579, Cl. 425-126.00R.

Rotondo, Thomas J.: *See—*
Rotondo, Philip L.; and Rotondo, Thomas J., 4,522,579, Cl. 425-126.00R.

Roussel, Michel: *See—*
Kunicki, Maryan; and Roussel, Michel, 4,522,648, Cl. 75-24.000.

Roussel Uclaf: *See—*
Delevallee , Francoise; and Deraedt, Roger, 4,522,816, Cl. 514-52.000.

Rowe, Raymond C.: *See—*
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Ruckle, W. Thomas: *See—*
Magid, David J.; and Ruckle, W. Thomas, 4,522,738, Cl. 252-90.000.
Ruedisueli, James W.: *See—*
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Ruhrchemie Aktiengesellschaft: *See—*
Cornils, Boy; Hibbel, Josef; Lieder, Bernhard; Much, Joachim; Schmidt, Volkmar; Wiebus, Ernst; and Konkol, Werner, 4,523,036, Cl. 568-454.000.
Rundall, George. Exercising device. 4,522,391, Cl. 272-62.000.
Ruoff, Harald: *See—*
Dudeck, Ingo; Hipp, Ulrich; Maass, Manfred; and Ruoff, Harald, 4,523,136, Cl. 318-568.000.
Rutgerswerke Aktiengesellschaft: *See—*
Grigoleit, Georg; Oberkobusch, Rudolf; Stadelhofer, Jurgen; and Matern, Kurt, 4,523,016, Cl. 546-252.000.
Ruth, Ulrich: *See—*
Struck, Helmut; Richter, Karl H.; Klein, Michael; Ruth, Ulrich; and Ulke, Walter, 4,522,418, Cl. 280-95.00A.
Ruthardt, Rolf, to Leybold-Heraeus GmbH. Device for manufacturing powder by dividing a melt. 4,522,577, Cl. 425-6.000.
Ryang, Hong-Son, to General Electric Company. Heat curable silicone-polyimide block copolymers. 4,522,985, Cl. 525-431.000.
Ryder, James H.: *See—*
Ansite, William K.; and Ryder, James H., 4,522,639, Cl. 55-314.000.
S. C. Johnson & Son, Inc.: *See—*
Verbrugge, Calvin J., 4,522,992, Cl. 526-272.000.
S.N.E.C.M.A.: *See—*
Bouiller, Jean G.; and Delonge, Jean-Claude L., 4,522,557, Cl. 415-115.000.
Sabema Material AB: *See—*
Thim, Stig, 4,522,367, Cl. 249-86.000.
Sable, Donald E. Closure device. 4,522,368, Cl. 251-1.00B.
Sagara, Noriyasu: *See—*
Koizumi, Hajime; Ohara, Shumpei; Kouda, Kiyoshi; Nagatomo, Muneshige; Sagara, Noriyasu; Togari, Satoshi; and Izumiyama, Hiroo, 4,522,254, Cl. 165-34.000.
Saia, Richard J.: *See—*
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Saitama Kako Co., Ltd.: *See—*
Torii, Masakatsu, 4,522,392, Cl. 272-142.000.
Saito, Koetsu: *See—*
Tone, Masayuki; Yano, Tsutomu; and Saito, Koetsu, 4,523,122, Cl. 310-334.000.
Saito, Makoto: *See—*
Akihama, Shigeyuki; Koizumi, Hajime; Umeki, Yoshihiko; Saito, Makoto; Banno, Tadashi; and Tateno, Shinya, 4,522,003, Cl. 52-391.000.
Saito, Shoichi; and Miyazi, Kazumi, to Olympus Optical Co., Ltd. Magnetic head adjusting apparatus. 4,523,242, Cl. 360-109.000.
Saito, Sigeru; Shimizu, Takahiko; and Tamura, Takasi, to Pentel Kabushiki Kaisha. Writing instrument having a needle slidably mounted in a tubular tip. 4,522,525, Cl. 401-258.000.
Saito, Tatsuhiko, to Yamato Scientific Co., Ltd. Elevational operating device for a rotary evaporator. 4,522,684, Cl. 159-11.200.
Saitoh, Keishi: *See—*
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,522,905, Cl. 430-60.000.
Saitoh, Kuniyuki: *See—*
Shigeta, Masatomo; Fukuda, Hiroyuki; Saitoh, Kuniyuki; and Kaji, Hisatsugu, 4,522,895, Cl. 429-44.000.
Saitou, Sinichi: *See—*
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Sakai, Shinji: *See—*
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Sakakura, Kazuaki: *See—*
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Sakamoto, Masaharu: *See—*
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Sakamoto, Naojiro: *See—*
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Sakamoto, Shinichi: *See—*
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Amano, Matsuo; Sakamoto, Shinichi; Miki, Masayuki; Sasayama, Takao; Suda, Seiji; Mouri, Yasunori; and Ishii, Toshio, 4,523,284, Cl. 364-431.120.
Sakiyama, Kazuo: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,522,966, Cl. 524-114.000.
Sakurai, Atsushi, to Canon Kabushiki Kaisha. Input device with a keyboard in which actuation of a key more than once may cause a different function to be performed. 4,523,298, Cl. 364-900.000.
Sakurai, Michio, to Alps Electric Co., Ltd. Dual shaft rotary electric device. 4,523,175, Cl. 338-134.000.
Sakurai, Shigeo, to Mikuni Kogyo Kabushiki Kaisha. Drive control method for stepping motors. 4,523,138, Cl. 318-685.000.
Salmon, John K.; and Hiller, Irving A., to Otis Elevator Company. Hydraulic tie-down for elevators. 4,522,285, Cl. 187-22.000.
Salomone, Teresa: *See—*
Marlettini, Maria G.; DeNovellis, Michelangelo; Labriola, Ernesto; Salomone, Teresa; and Tomassetti, Paola, 4,522,827, Cl. 514-671.000.
Salter, Keith, to Baker Perkins Holdings PLC. Mixing apparatus. 4,522,503, Cl. 366-287.000.
Sambrook, Rodney M.; and Ross, Julian R. H., to Dyson Refractories Limited. Method of preparing a catalyst and catalyst prepared by the method. 4,522,940, Cl. 502-328.000.
Samuelsson, Einar, to AB Hagglund & Soner. Hydraulic radial piston motor. 4,522,110, Cl. 91-488.000.
Sanada, Yuichi: *See—*
Yoshida, Kenji; and Sanada, Yuichi, 4,522,419, Cl. 280-96.000.
Sanders, Virgil E., to Litton Systems, Inc. Laser gyro mode locking reduction scheme. 4,522,496, Cl. 356-350.000.
Sandford, Donald L.: *See—*
Timm, Gerald W.; Sandford, Donald L.; Claude, Timothy J.; and Helms, Richard A., 4,522,198, Cl. 128-79.000.
Sangamo Weston, Inc.: *See—*
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Sangu, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Scanning control apparatus and method therefor. 4,523,234, Cl. 358-293.000.
Sano, Hideo: *See—*
Musumiya, Raita; Sano, Hideo; Izichi, Yasuto; Inoue, Mitsuru; and Izawa, Kenzyu, 4,522,082, Cl. 74-512.000.
Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular steering system. 4,522,416, Cl. 280-91.000.
Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,522,417, Cl. 280-91.000.
Sano, Yutaka: *See—*
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,522,691, Cl. 204-18.100.
Sanofi: *See—*
Wagnon, Jean; Gautier, Patrick; and Gagnol, Jean-Pierre, 4,522,824, Cl. 514-414.000.
Sanofi, S.A.: *See—*
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Sanshin Kogyo Kabushiki Kaisha: *See—*
Okazaki, Masaki, 4,522,602, Cl. 440-77.000.
Santi, John D., to Briggs & Stratton Corp. Laminated wheel assembly. 4,522,080, Cl. 74-445.000.
Sanyo Electric Co., Ltd.: *See—*
Hayashi, Nobutaka; and Komori, Yoshinori, 4,523,236, Cl. 358-341.000.
Sartorius GmbH: *See—*
Nussbaumer, Dietmar; Perl, Horst; and Vinh, Khuong T., 4,522,713, Cl. 210-136.000.
Sasagawa, Katsuyoshi; Hyugaji, Akio; and Imai, Masao, to Mitsui Toatsu Chemicals, Incorporated. Resin for high-refractivity lenses and lenses made of same resin. 4,522,993, Cl. 526-292.400.
Sasaki, Mitsuru: *See—*
Kohsaka, Hideo; Sasaki, Mitsuru; and Ishiguri, Yukio, 4,522,817, Cl. 514-95.000.
Sasamoto, Nobuhiko: *See—*
Ochiai, Hideo; Nagoya, Yoshinari; Fujimoto, Ryoichi; Yamazaki, Susumu; Sasamoto, Nobuhiko; and Ishida, Shinichi, 4,522,040, Cl. 62-419.000.
Sasayama, Takao: *See—*
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Amano, Matsuo; Sakamoto, Shinichi; Miki, Masayuki; Sasayama, Takao; Suda, Seiji; Mouri, Yasunori; and Ishii, Toshio, 4,523,284, Cl. 364-431.120.
Sashiki, Takashi: *See—*
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Sasscer, Lawrence D., to Sperry Corporation. Cache/disk system with writeback regulation relative to use of cache memory. 4,523,206, Cl. 364-200.000.
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Sato, Akihiro: *See—*
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Sato, Hideo: *See—*
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Sato, Jun; and Nakajima, Hideki, to Shimano Industrial Company Limited. Fishing reel having a spool rotation control mechanism. 4,522,354, Cl. 242-219.000.
Sato, Yu, to Nippon Kogaku K. K. PLL out-of-capture range detection and lock acquisition circuit. 4,523,157, Cl. 331-4.000.
Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, to Matsushita Electric Industrial Co., Ltd. Optical data recording and reproducing apparatus. 4,523,304, Cl. 369-32.000.
Satre, Kenneth I.: *See—*
Kallestad, Daniel R.; Kress, Bruce A.; and Satre, Kenneth I., 4,522,335, Cl. 236-44.00C.
Saturday, Katny A.: *See—*
Hochel, Robert C.; and Saturday, Kathy A., 4,522,794, Cl. 423-251.000.

Sauer, Don R., to National Semiconductor Corporation. Anti-distortion anti-transient tone control circuit. 4,523,156, Cl. 330-282.000.
Saunders, Philip G.; and Simpson, Jack R., to Container Graphics Corporation. Hole punch for a cutting die. 4,522,095, Cl. 83-116.000.
Saur, Roland, to Behr-Thomson Dehnstoffregler GmbH. Thermostatic control device. 4,522,334, Cl. 236-34.500.
Savage, William E., to Tompkins Bros. Co. Inc. Knitting machine using combination presser raising wheel. 4,522,043, Cl. 66-80.000.
Savin Corporation: *See*—
Landa, Benzion, 4,522,484, Cl. 355-3.0DD.
Savins, Joseph G., to Mobil Oil Corporation. Method for removing ash mineral matter of coal with liquid carbon dioxide and water. 4,522,628, Cl. 44-1.0SR.
Sawyer, John M.: *See*—
Kluss, Karl K.; Allen, Terry F.; and Sawyer, John M., 4,522,235, Cl. 138-130.000.
Saxer, Ulrich P.: *See*—
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Sayer, Bertram; and Kulkaski, Bernard J., to Thermal Profiles, Inc. Window apparatus. 4,521,991, Cl. 49-161.000.
Scanditronix Inc.: *See*—
Emanuelson, Roy M.; and Lebet, David P., 4,523,168, Cl. 335-296.000.
Schaber, Scott D.: *See*—
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Schack, Carl J.; and Flanagan, Joseph E., to Rockwell International Corporation. Alkyl, azido, nitro ethers and method of preparation. 4,522,756, Cl. 260-349.000.
Schad, Robert D.; and Rees, Herbert, to Husky Injection Molding Systems Ltd. System for handling partly finished workpieces. 4,522,581, Cl. 425-534.000.
Schaefer, Roland, to Kulzer & Co. GmbH. Process for the photopolymerization of vinyl compounds and photopolymerizable materials used in said process. 4,522,694, Cl. 204-159.240.
Schaeffer, Wayne G.: *See*—
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Schafer, Karl: *See*—
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Schartz, Charles O. Peristaltic pump apparatus. 4,522,570, Cl. 417-475.000.
Schedele, Helmut, to Siemens Aktiengesellschaft. Contact arrangement for relays. 4,523,165, Cl. 335-106.000.
Scheffers, Richard W., to Signode Corporation. Registration of bags in a filling machine. 4,522,017, Cl. 53-570.000.
Schema, Anthony C.: *See*—
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Schenk, William N.: *See*—
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Schering Aktiengesellschaft: *See*—
Dorow, Rainer; Horowski, Reinhard; Kehr, Wolfgang; and Wachtel, Helmut, 4,522,820, Cl. 424-288.000.
Gries, Heinz; and Mutzel, Wolfgang, 4,522,839, Cl. 426-548.000.
Schider, Siegfried: *See*—
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Schiederwerk Gunter Schmidt KG Fabrik fur Apparate der Fernmelde- und Elektrotechnik: *See*—
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Schiff, Peter. Apparatus for left heart assist. 4,522,195, Cl. 128-1.00D.
Schindler, Harvey D., to Lummus Company, The. Coal liquefaction. 4,522,700, Cl. 208-8.0LE.
Schinke, Ralph: *See*—
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Schipfer, Rudolf; and Schmolzer, Gerhard, to Vianova Kunstharz, A.G. Crosslinking component for paint binders and process for producing such components from a carbonyl compound. 4,523,007, Cl. 528-227.000.
Schlom, Jeffery; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye. Process for producing monoclonal antibodies reactive with human breast cancer. 4,522,918, Cl. 435-68.000.
Schluderberg, Donald C., to Babcock & Wilcox Company, The. Integral nuclear fuel element assembly. 4,522,781, Cl. 376-427.000.
Schlussler, Hans-Joachim: *See*—
Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, 4,522,740, Cl. 252-174.210.
Schmale, Peter C.; and Van Buul, Marinus C. W., to U.S. Philips Corporation. Safety circuit for a detachable connecting cable. 4,523,248, Cl. 361-1.000.
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Schmid, Karl; Baumann, Horst; Geke, Jurgen; Germscheid, Hans-Gunther; Ludecke, Werner; Piorr, Robert; Rossmann, Christian; Scharf, Rolf; and Schlussler, Hans-Joachim, to Henkel Kommanditgesellschaft. Polyglycol ethers as foam-inhibiting additives in low-foam cleaning agents. 4,522,740, Cl. 252-174.210.
Schmid, Kurt: *See*—
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Schmidt, John R. Character data input keyboard arrangement having central matrix of keys. 4,522,518, Cl. 400-486.000.
Schmidt, Karl W., to Gebruder Schmidt GMBH & Co. KG. Clockwork retaining assembly. 4,522,509, Cl. 368-300.000.
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Schmidt, Volkmar: *See*—
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Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, 4,523,222, Cl. 358-27.000.
Schmieder, Klaus: *See*—
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Markbreiter, Stephen J.; and Schorr, Hans P., 4,522,636, Cl. 55-23.000.
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Wheelock, Kenneth S.; and Schucker, Robert C., 4,522,706, Cl. 208-121.000.
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nik. Device for releasably connecting optical waveguide fibers. 4,522,463, Cl. 350-96.210.

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Scientific Atlanta Inc.: *See—*
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Martino, Phillip C.; and Winner, Peter P., 4,522,961, Cl. 523-407.000.

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Sheridan, Denise, 4,522,446, Cl. 297-377.000.

Seemuth, Paul D., to Ethyl Corporation. Diesel fuel composition. 4,522,630, Cl. 44-53.000.

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Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,522,691, Cl. 204-18.100.

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Das, Suryya K.; Boberski, William G.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,522,958, Cl. 523-212.000.

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Giubbolini, Marco; and Marziali, Walter, 4,523,291, Cl. 364-724.000.

Selvidge, Leroy. Dental tool for cleaning teeth interproximally. 4,522,595, Cl. 433-142.000.

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Abel, William E., 4,523,184, Cl. 340-539.000.

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Shacklette, Lawrence W., to Allied Corporation. Secondary battery containing organoborate electrolyte. 4,522,901, Cl. 429-194.000.

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Miller, William P.; and Shah, Atul, 4,522,435, Cl. 285-256.000.

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Shannon, Michael A., to Northern Telecom Limited. Monitoring magnetically permeable particles in admixture with a fluid carrier. 4,522,501, Cl. 366-142.000.

Shapiro, Sumner, to Star Textile Research, Inc. Method and device for packaging and shipping high-loft batting. 4,522,556, Cl. 414-786.000.

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Sharkozy, Frank L.; and Kiesler, James A., to Printing Developments, Inc. Photopolymer coated lithographic printing plate. 4,522,912, Cl. 430-278.000.

Sharma, Bhavender P.: *See—*
Tennent, David L.; and Sharma, Bhavender P., 4,522,924, Cl. 501-2.000.

Sharma, Shri C., to Warner-Lambert Company. Roasted coated nut product and process therefor. 4,522,833, Cl. 426-93.000.

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Hoek, Arend; Minderhoud, Johannes K.; and Post, Martin F. M., 4,522,938, Cl. 502-307.000.
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Casstevens, Arvil; Coble, William H.; Shields, Harper; Ferrell, Roscoe M.; and Jordan, Bobby R., 4,522,042, Cl. 66-140.00S.
Lineberry, Roger D.; and Shields, Harper, 4,522,044, Cl. 66-185.000.

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Nagano, Masashi, 4,522,610, Cl. 474-141.000.
Sato, Jun; and Nakajima, Hideki, 4,522,354, Cl. 242-219.000.

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Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; Fujikawa, Kazuhiko; and Tsumiyama, Takatoshi, 4,522,689, Cl. 203-52.000.

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organic compositions containing such stabilizers. 4,523,024, Cl. 549-407.000.
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Shook, James M.: *See*—
Edwards, Merle L.; Meyer, Wayne A.; and Shook, James M., 4,522,019, Cl. 56-202.000.
Short, Edward P.; and Bernardo, Gerald, to Alcan International Limited. Carrier for material during electrolytic finishing. 4,522,696, Cl. 204-297.00W.
Short, William T.; and Ottaviani, Robert A., to General Motors Corporation. Urea flow control agents for urethane paint prepared by reaction of an isocyanate-terminated prepolymer and an ethanolamine. 4,522,986, Cl. 525-458.000.
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Siedow, Fred G.: *See*—
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Siegel, Carole E.: *See*—
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Brajder, Antonio; and Hantke, Klaus, 4,523,268, Cl. 363-98.000.
Grunberg, Kurt; Poth, Rainer; Werner, Peter; Koch, Kurt; Schweppe, Friedrich; and Voigtlander, Kurt, 4,523,253, Cl. 361-335.000.
Heidegger, Peter; and Kiefer, Jakob, 4,523,219, Cl. 357-79.000.
Lubke, Wilfried, 4,522,560, Cl. 415-210.000.
Luder, Rainer; and Haussmann, Wolfgang, 4,523,223, Cl. 358-27.000.
Schedele, Helmut, 4,523,165, Cl. 335-106.000.
Zirkl, Siegmar, 4,523,103, Cl. 307-141.000.
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Persyk, Dennis E., 4,523,091, Cl. 250-213.0VT.
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Walz, Theo, 4,522,294, Cl. 198-429.000.
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Nikolich, Milovan, 4,522,162, Cl. 123-46.50C.
Scheffers, Richard W., 4,522,017, Cl. 53-570.000.
Sikula, William J., Jr.: *See*—
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Silver, William, to Thomson-Leeds Company, Inc. Rack module. 4,522,306, Cl. 211-49.100.
Silvey, Elmer R. Saw chain depth gauge grinder. 4,522,087, Cl. 76-25.00A.
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Hoen, Cuyler; and Pufpaff, Frederick J., 4,522,436, Cl. 292-113.000.
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Green, Robert H.; and Simon, James D., 4,522,240, Cl. 144-193.00E.
Simonin, Philippe. Method of skin treatment and device for carrying out the said method. 4,522,210, Cl. 128-421.000.
Simonsen, Knud; and Holan, Mirek. Vacuum agitator for meat products. 4,522,118, Cl. 99-472.000.
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Sjostrom, Douglas D.: *See*—
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Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Beyfuss, Berthold, 4,522,514, Cl. 384-569.000.
Skreba, Gerhard: *See*—
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Skrynecki, Robert: *See*—
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Slattery, Ian, to Spencer Wright Industries, Inc. Cut/loop hook for tufting machines. 4,522,132, Cl. 112-79.00R.
Slavin, Sidney H. Spinning optics device. 4,522,474, Cl. 351-203.000.
Slee, Roger H., to AE PLC. Valve seat inserts. 4,522,161, Cl. 123-41.850.
Small, Edward A.; and Wright, Geoff C., to British American Bank Note Inc. Printed magnetic encoding panel. 4,522,428, Cl. 283-82.000.
Small, LeRoy O. Variable position light stand. 4,523,256, Cl. 362-11.000.
Smick, D. Neal. Seed flow divider attachment for seed drills. 4,522,291, Cl. 193-23.000.
Smith, Alan K.; and Alexander, Stephen R. Ambidextrous gun magazine release. 4,521,985, Cl. 42-7.000.
Smith, Alan M.: *See*—
Pettigrew, Robert M.; Bradbrook, John D.; Smith, Alan M.; and Fisher, John H., 4,522,482, Cl. 355-3.00R.
Smith, Arthur B.: *See*—
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Smith, C. Byron: *See*—
Dechow, Fred J.; Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., 4,522,836, Cl. 426-271.000.
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Dorsett, Danny R.; and Smith, Gerald D., Jr., 4,523,259, Cl. 362-120.000.
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Kellner, Jackson M.; and Garrett, William R., 4,522,234, Cl. 138-108.000.
Smith, John H.: *See*—
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Brown, Thomas H., 4,523,015, Cl. 544-320.000.
Smith & Loveless, Inc.: *See*—
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Smith, Michael J. T., to Rolls-Royce Limited. Noise measurement. 4,522,283, Cl. 181-175.000.
Smith, Raymond H. Magnetic reciprocating motor. 4,523,114, Cl. 310-24.000.
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Jacquet, Bernard; Lang, Gerard; and Malaval, Alain, 4,522,808, Cl. 424-59.000.
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Soclof, Sidney I., to Rockwell International Corporation. Method for producing PNP type lateral transistor separated from substrate by O.D.E. for minimal interference therefrom. 4,522,682, Cl. 156-647.000.
Soelberg, Kenneth B.: *See*—
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Jones, C. Andrew; and Sofranko, John A., 4,523,050, Cl. 585-500.000.
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Roscrow, Harold N.; Ewer, Ronald W.; and Squires, Philip H., 4,522,768, Cl. 264-2.200.

Solaja, Nikola. Grading and smoothing attachment for a loader bucket. 4,521,980, Cl. 37-117.500.

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Menezes, Edgar V.; Southern, John H.; Ballman, Richard L.; and Chamberlin, J. M., 4,522,773, Cl. 264-167.000.

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Gallup, Darrell L.; and Featherstone, John L., 4,522,728, Cl. 210-714.000.

Southern Railway Company: *See*—
Miller, John R.; and Stubbs, John L., 4,522,127, Cl. 104-17.00R.

Southwest Research Institute: *See*—
Winn, Bryan D. C., 4,523,294, Cl. 364-900.000.

Sova, Stanley G.: *See*—
Chisvette, Dominick; Lattimore, James; and Sova, Stanley G., 4,522,654, Cl. 106-288.00Q.

Sovonics Solar Systems: *See*—
Ovshinsky, Stanford R.; and Izu, Masatsugu, 4,522,663, Cl. 148-403.000.

Spang & Company: *See*—
Huth, Joseph F., III, 4,523,170, Cl. 336-83.000.

Speers, Leonard E.; Inhofer, John D.; and Redenbarger, Philip D., to J. I. Case Company. Fan-shroud structure. 4,522,160, Cl. 123-41.490.

Spencer Wright Industries, Inc.: *See*—
Beverly, Ian, 4,522,139, Cl. 112-273.000.
Slattery, Ian, 4,522,132, Cl. 112-79.00R.

Sperinde, Johnie M.; Goldring, Stanley D.; and Miller, Dean T., to Oximetrix, Inc. Apparatus for determining oxygen saturation levels in blood. 4,523,279, Cl. 364-416.000.

Sperry Corporation: *See*—
Blakeslee, Edward A., 4,522,018, Cl. 56-181.000.
Burns, Gary D.; and Schaber, Scott D., 4,523,314, Cl. 371-38.000.
Kregness, Glen R., 4,523,210, Cl. 364-760.000.
Neis, Thomas W.; and Swartz, Harold L., 4,521,974, Cl. 33-379.000.
Sasscer, Lawrence D., 4,523,206, Cl. 364-200.000.
Swenson, Robert E.; Sasscer, Lawrence D.; and Robinson, Don M., 4,523,275, Cl. 364-200.000.

Sprague Electric Company: *See*—
Rogers, Donald G., 4,523,255, Cl. 361-433.000.

Sprenkle, George J., to Burroughs Corporation. Device for the controlled extraction of electronic circuit components. 4,521,959, Cl. 29-741.000.

Sprinter Systems Incorporated: *See*—
Stannard, Charles G., 4,522,618, Cl. 493-143.000.

Sputtered Films, Inc.: *See*—
Dimock, Jack A.; and Clarke, Peter J., 4,522,697, Cl. 204-298.000.

Squires, Philip H.: *See*—
Roscrow, Harold N.; Ewer, Ronald W.; and Squires, Philip H., 4,522,768, Cl. 264-2.200.

SSIH Equipment S.A.: *See*—
Bovay, Jean-Pierre, 4,523,204, Cl. 346-107.00B.

Staar, Marcel J. H., to Staar S. A. Record loading apparatus for a slot type record player. 4,523,306, Cl. 369-77.100.

Staar S. A.: *See*—
Staar, Marcel J. H., 4,523,306, Cl. 369-77.100.

Staats, James E., to General Electric Company. Microwave oven door seal. 4,523,069, Cl. 219-10.55D.

Stadelhofer, Jurgen: *See*—
Grigoleit, Georg; Oberkobusch, Rudolf; Stadelhofer, Jurgen; and Matern, Kurt, 4,523,016, Cl. 546-252.000.

Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Open end friction spinning machine. 4,522,023, Cl. 57-401.000.

Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,522,023, Cl. 57-401.000.

Stair, Wayne H.: *See*—
Scriver, Richard M.; and Stair, Wayne H., 4,522,970, Cl. 524-447.000.

Stalder, Hans; and Sidler, Hans, to Sistag, Maschinenfabrik Sidler Stalder AG. Gate valve construction. 4,522,224, Cl. 137-242.000.

Stamm, Thomas A.; and Zansky, Zoltan, to Honeywell Inc. Remote control of dimmable electronic gas discharge lamp ballasts. 4,523,128, Cl. 315-291.000.

Standard Manufacturing Co., Inc.: *See*—
Oswald, Norman D.; Dean, Robert R.; and Mankey, Harry S., 4,522,548, Cl. 414-458.000.

Standard Societe Anonyme: *See*—
Van de Moortele, Guido, 4,522,229, Cl. 137-460.000.

Stanley Aviation Corporation: *See*—
Valentine, Gordon A.; and Gale, Edwin J., 4,522,433, Cl. 285-93.000.

Stanley Tools Limited: *See*—
Gibbs, Andrew R., 4,522,539, Cl. 408-72.00R.

Stannard, Charles G., to Sprinter Systems Incorporated. Mechanism for assembling tapered, nested containers. 4,522,618, Cl. 493-143.000.

Stappaerts, Eddy A., to Northrop Corporation. Uniform-field electrode. 4,523,320, Cl. 372-87.000.

Star Textile Research, Inc.: *See*—
Shapiro, Sumner, 4,522,556, Cl. 414-786.000.

Stark, Marvin M.; Soelberg, Kenneth B.; and Pelzner, Roger B., to Marvin M. Stark Research Foundation. Light shield for a dental handpiece. 4,522,594, Cl. 433-141.000.

Starks, Michael R.: *See*—
Lipton, Lenny; Starks, Michael R.; Stewart, James D.; and Meyer, Lawrence D., 4,523,226, Cl. 358-88.000.

Starkweather, James A.: *See*—
Brown, William H.; Starkweather, James A.; and Humphreys, Hugh M., 4,523,310, Cl. 370-112.000.

Starmax, Inc.: *See*—
Flanagan, Elaine W., 4,521,999, Cl. 52-103.000.

Starmuhler, Erwin: *See*—
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,523,283, Cl. 364-431.010.

Starr, James A., to Atasi Corporation. Payload-protecting shipping container. 4,522,303, Cl. 206-588.000.

Stasikelis, Peter J.: *See*—
Yannas, Ioannis V.; Burke, John F.; and Stasikelis, Peter J., 4,522,753, Cl. 260-123.700.

Statni Vyzkumny Ustav Ochrany Materialu G.V.: *See*—
Novak, Vaclav; Prusek, Jaroslav; and Trojan, Vaclav, 4,522,699, Cl. 204-434.000.

Stednitz, Denis P., to ACE Orthopedic Company. Adjustable intramedullar rod. 4,522,200, Cl. 128-92.0BC.

Stefansson, Rafn, to Bell & Howell Company. Sheet feeder systems. 4,522,385, Cl. 271-10.000.

Steidle, Alfons: *See*—
Leibinger, Paul; and Steidle, Alfons, 4,523,176, Cl. 338-179.000.

Steimel, Ronald W.: *See*—
Woodcock, Sidney H.; Maes, Michel E.; and Steimel, Ronald W., 4,522,107, Cl. 89-196.000.

Steiner, Gerald E., to Anchor Hocking Corporation. Child-resistant tamper-evident closure. 4,522,307, Cl. 215-219.000.

Stephenson, Michael C. Waterbed frame construction. 4,521,928, Cl. 5-400.000.

Stereographics Corporation: *See*—
Lipton, Lenny; Starks, Michael R.; Stewart, James D.; and Meyer, Lawrence D., 4,523,226, Cl. 358-88.000.

Sterling Drug Inc.: *See*—
Paikoff, Myron, 4,522,302, Cl. 206-570.000.

Stevens, James C.; and Haynes, James R., to Uniden Corporation of America. Ringer signal wave shaping circuit. 4,523,058, Cl. 179-84.00T.

Stewart, James D.: *See*—
Lipton, Lenny; Starks, Michael R.; Stewart, James D.; and Meyer, Lawrence D., 4,523,226, Cl. 358-88.000.

Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Method of operating a fluidized bed heat exchanger utilizing induced circulation. 4,521,976, Cl. 34-10.000.

Still, Robert D., Jr.; and Boeke, Paul J. Stampable sheets of bonded laminate of metal sheet and fiber mat reinforced poly(arylene sulfide) and method of preparation using radio frequency energy. 4,522,875, Cl. 428-285.000.

Stockbridge, Bruce W., to Eastman Kodak Company. Dowel-aligned multiple plate stuffer box crimper construction for filter tow. 4,521,944, Cl. 28-264.000.

Stockton, Thomas R., to Ford Motor Company. Steering gear control valve for variable displacement pump. 4,522,565, Cl. 417-220.000.

Stokes, Bruce G.: *See*—
Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., 4,522,967, Cl. 524-377.000.

Stolz, Hermann, to Mato Maschinen-und Metallwarenfabrik Curt Matthaei GmbH & Co KG. Apparatus for pressing-in belt connectors. 4,522,329, Cl. 227-153.000.

Stone, Julian, to AT&T Bell Laboratories. Raman gain medium. 4,523,315, Cl. 372-3.000.

Stone, Richard M.: *See*—
Walczak, Thomas J.; Stone, Richard M.; and Cristiano, Gary M., 4,523,155, Cl. 330-279.000.

Stone, Selden A. Convertible boat and luggage carrier. 4,522,145, Cl. 114-352.000.

Stonner, Hans-Martin: *See*—
Hochgesand, Gerhard; Kahles, Heinz; Wiesner, Paul; and Stonner, Hans-Martin, 4,522,730, Cl. 210-750.000.

Storage Technology Corporation: *See*—
Billington, Robert L., 4,523,243, Cl. 360-113.000.

Stran Corporation: *See*—
Brazelton, Carl L., 4,522,502, Cl. 366-160.000.

Strehlow, Robert J.: *See*—
Tamura, Paul S.; and Strehlow, Robert J., 4,523,084, Cl. 219-497.000.

Stromberg-Carlson Corporation: *See*—
Bull, John; Croft, Leon; DeVaney, David B.; Davis, Russell R.; Hinshaw, David L.; Jotwani, Haresh C.; Kandell, Ronald J.; Kurtz, Richard F.; Lee, Ernest O., Jr.; Neumeier, Gunter F.; Richards, Glenn L.; and Scott, Richard, 4,523,308, Cl. 370-56.000.

Stromberg, James L., to Halliburton Company. Quick connect coupler. 4,522,430, Cl. 285-24.000.
Strout, Russell B.; and Golner, Jerold J., to Borden, Inc. Portable, manually operable dispenser for stretch film and the like, and process of applying. 4,522,348, Cl. 242-96.000.
Struck, Helmut; Richter, Karl H.; Klein, Michael; Ruth, Ulrich; and Ulke, Walter, to Daimler-Benz Aktiengesellschaft. Steerable wheel suspension arrangement. 4,522,418, Cl. 280-95.00A.
Stuart, Clifton F. Gravity self-aligning article mount. 4,522,363, Cl. 248-225.200.
Stubbmann, Albert, to Shelcore, Inc. Rockable toy with a reflecting mirror. 4,522,604, Cl. 446-219.000.
Stubbs, John L.: *See*—
Miller, John R.; and Stubbs, John L., 4,522,127, Cl. 104-17.00R.
Sturdevant, Eugene J. Electrode shield device. 4,523,082, Cl. 219-399.000.
Suda, Seiji: *See*—
Amano, Matsuo; Sakamoto, Shinichi; Miki, Masayuki; Sasayama, Takao; Suda, Seiji; Mouri, Yasunori; and Ishii, Toshio, 4,523,284, Cl. 364-431.120.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG.: *See*—
Nonnenmann, Manfred; Oltmanns, Heinrich; and Hohhausel, Manfred, 4,521,947, Cl. 29-157.00R.
Sueyasu, Masanobu: *See*—
Nakajima, Hidemasa; Okamura, Shozo; Sueyasu, Masanobu; Furujho, Sakae; Okane, Kohji; and Anezaki, Shoji, 4,522,650, Cl. 75-48.000.
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, to Seiko Instruments & Electronics Ltd. Method for manufacturing a multicolor filter and a multicolor display device. 4,522,691, Cl. 204-18.100.
Sullivan, James J. Manually mountable tamper evident oral liquid dose viral and seal assembly. 4,522,308, Cl. 215-253.000.
Sullivan, James L., to Chartered Industries of Singapore Private Limited. Gun hammer mechanism. 4,522,106, Cl. 89-140.000.
Sulouff, Robert E.; Hartin, Sam S.; Cook, Koy B.; Kerns, David V., Jr.; Davidson, Jimmy L.; and Warren, Keith O., to Insouth Microsystems, Inc. Electromechanical transducer strain sensor arrangement and construction. 4,522,072, Cl. 73-765.000.
Sumitomo Chemical Company, Limited: *See*—
Fukushima, Nobuo; Kitagawa, Yoshihiko; Okumura, Takuzo; and Sakakura, Kazuaki, 4,522,955, Cl. 521-143.000.
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,522,966, Cl. 524-114.000.
Kohsaka, Hideo; Sasaki, Mitsuru; and Ishiguri, Yukio, 4,522,817, Cl. 514-95.000.
Kohsaka, Hideo; Mitsuru, Sasaki; and Ishiguri, Yukio, 4,522,942, Cl. 514-95.000.
Sumitomo Electric Industries, Ltd.: *See*—
Tsuno, Koichi, 4,522,113, Cl. 92-113.000.
Sumitomo Metal Industries, Ltd.: *See*—
Nakajima, Hidemasa; Okamura, Shozo; Sueyasu, Masanobu; Furujho, Sakae; Okane, Kohji; and Anezaki, Shoji, 4,522,650, Cl. 75-48.000.
Nakate, Hiroshi; Kondo, Masatoshi; and Gosho, Nobuyuki, 4,523,072, Cl. 219-67.000.
Sumitomo Metal Mining Company, Ltd.: *See*—
Kato, Yoshihisa, 4,523,218, Cl. 357-70.000.
Sumrall, Calhoun W.: *See*—
Bains, William R.; and Sumrall, Calhoun W., 4,522,357, Cl. 244-3.220.
Sun Tech, Inc.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,522,757, Cl. 260-396.00R.
Sunada, Satoshi. Gas-liquid contacting device. 4,522,766, Cl. 261-91.000.
Sundstrand Corporation: *See*—
Mehl, Byron R., 4,523,267, Cl. 363-87.000.
Sundstrand Data Control, Inc.: *See*—
Peters, Rex B., 4,522,062, Cl. 73-505.000.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks Inc. Analgesic and anti-inflammatory compositions comprising diphenhydramine and methods of using same. 4,522,826, Cl. 514-569.000.
Sutter, Leroy V., Jr.: *See*—
Bancroft, Charles F.; Brown, Thomas B.; Bullock, Peter W.; and Sutter, Leroy V., Jr., 4,523,071, Cl. 219-56.220.
Suzuki, Haruo: *See*—
Kawai, Toshikazu; Suzuki, Haruo; and Kaneda, Shouzou, 4,523,041, Cl. 568-755.000.
Suzuki, Keizo: *See*—
Ninomiya, Ken; Suzuki, Keizo; and Nishimatsu, Shigeru, 4,522,674, Cl. 156-345.000.
Suzuki, Masayoshi: *See*—
Wakamori, Fumio; Noma, Toshiyuki; Adachi, Masao; Funabashi, Motohisa; and Suzuki, Masayoshi, 4,522,534, Cl. 405-37.000.
Suzuki, Norihito: *See*—
Iwaki, Akio; Suzuki, Norihito; Yamamoto, Takeshi; and Aoki, Toru, 4,522,891, Cl. 428-626.000.
Suzuki, Takatoshi; Tachikawa, Hideo; and Moriyama, Shigeo, to Kubushiki Kaisha Toyota Chuo Kenkyusho. Process for ion nitriding of aluminum or an aluminum alloy and apparatus therefor. 4,522,660, Cl. 148-20.300.
Suzuki, Takeshi: *See*—
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Kajiwara, Akiharu; and Ota, Kiichiro, 4,522,759, Cl. 260-404.000.
Suzuki, Toshitake; Hayashi, Ryuzo; Arai, Naoto; and Oeda, Yoshitaka, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording materials. 4,523,205, Cl. 346-208.000.
Suzuki, Yutaka: *See*—
Yano, Kiyotoshi; Suzuki, Yutaka; and Yamada, Yoshichika, 4,522,372, Cl. 251-141.000.
SW Daniel, Inc.: *See*—
Atchisson, Maxwell G., 4,522,105, Cl. 89-139.000.
Swander, Robert E.: *See*—
Hyde, Rebecca A.; Krimminger, Kenneth R.; and Swander, Robert E., 4,522,616, Cl. 493-44.000.
Swartz, Franklin J.; and Anatolev, Alex. Police baton. 4,522,398, Cl. 273-84.00R.
Swartz, Harold L.: *See*—
Neis, Thomas W.; and Swartz, Harold L., 4,521,974, Cl. 33-379.000.
Swenson, Robert E.; Sasscer, Lawrence D.; and Robinson, Don M., to Sperry Corporation. Cache/disk subsystem with floating entry. 4,523,275, Cl. 364-200.000.
Swiger, Roger T.; and Hallgren, John E., to General Electric Company. Scavengers for one component alkoxy-functional RTV compositions. 4,523,001, Cl. 528-18.000.
Swisher, Steven L., to Brunswick Corporation. Drag adjustment click spring assembly. 4,522,347, Cl. 242-84.50A.
Syntex (U.S.A.) Inc.: *See*—
Eppstein, Deborah A.; Fraser-Smith, Elizabeth B.; and Matthews, Thomas R., 4,522,811, Cl. 514-2.000.
Walker, Keith A. M., 4,522,948, Cl. 514-396.000.
Syracuse University: *See*—
Heise, Michael S.; Tucker, Christopher S.; and Schwarz, James A., 4,522,941, Cl. 502-333.000.
Szonn, Bodo; Schafer, Karl; and Malskeit, Alfred, to Beiersdorf Aktiengesellschaft. Elastic diaper-pants fastening. 4,522,853, Cl. 428-40.000.
Szycher, Michael, to Thermedics, Inc. Extrudable polyurethane for prosthetic devices prepared from a diisocyanate, a polytetramethylene ether polyol, and 1,4-butane diol. 4,523,005, Cl. 528-76.000.
T. D. Williamson, Inc.: *See*—
Ver Nooy, Burton, 4,522,063, Cl. 73-579.000.
Tabares, Gilbert, to Xerox Corporation. Dual-axis positioning apparatus adjusting the angular position of an optical element. 4,522,365, Cl. 248-466.000.
Tabler, Donald C. Filtration of oil. 4,522,729, Cl. 210-727.000.
Tacheny, John C.; and Schema, Anthony C., to Truth Incorporated. Chain operator for a window. 4,521,993, Cl. 49-325.000.
Tachikawa, Hideo: *See*—
Suzuki, Takatoshi; Tachikawa, Hideo; and Moriyama, Shigeo, 4,522,660, Cl. 148-20.300.
Tachikawa Spring Co., Ltd.: *See*—
Horii, Hitoshi; and Oonishi, Yutaka, 4,523,075, Cl. 219-88.000.
Tafel, William G. Archery quiver and method. 4,522,187, Cl. 124-24.00A.
Taga, Yutaka: *See*—
Noda, Munetaka; Tobe, Yukio; Taga, Yutaka; Nakamura, Shinya; Nakamura, Kazumasa; Inagaki, Takafumi; and Ito, Hiroshi, 4,523,281, Cl. 364-424.100.
Taglieber, Volker: *See*—
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Tahlmore, Claude D.: *See*—
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Taiho Kogyo Co., Ltd.: *See*—
Nozue, Shigehiro; and Fukuoka, Tatsuhiko, 4,522,513, Cl. 384-368.000.
Takagi, Satoshi: *See*—
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,523,241, Cl. 360-105.000.
Takagi, Takeji: *See*—
Nishikawa, Masaji; Takagi, Takeji; and Ueki, Masao, 4,522,866, Cl. 428-216.000.
Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,523,211, Cl. 357-4.000.
Takahara, Kazuhiro; Kurahashi, Keizo; Gondo, Hiroyuki; Oki, Kenichi; and Miura, Shoshin, to Fujitsu Limited. El display device. 4,523,189, Cl. 340-781.000.
Takahashi, Asao: *See*—
Yokogawa, Akira; Takahashi, Asao; Maruyama, Isao; and Hosaka, Takao, 4,522,688, Cl. 203-28.000.
Takahashi, Sadayuki; Yonezawa, Masatomo; Ochi, Atsushi; Yano, Takeshi; Hamatsuki, Takeshige; and Fukui, Izumu, to NEC Corporation. Multilayer electrostrictive element which withstands repeated application of pulses. 4,523,121, Cl. 310-334.000.
Takahashi, Shiro, to Sony Corporation. Sliding member. 4,523,245, Cl. 360-130.210.
Takahashi, Shuzou; and Toda, Hiroaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas-insulated bushing. 4,523,052, Cl. 174-16.0BH.
Takai, Akira: *See*—
Nishimura, Hirofumi; Oda, Hiroyuki; Kaneko, Tadashi; Takai, Akira; and Takeuchi, Nobuo, 4,522,179, Cl. 123-481.000.
Takai, Kazuki: *See*—
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Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuji, to Nippondenso Co., Ltd. Air flow control apparatus for internal combustion engine. 4,522,176, Cl. 123-339.000.

Takasago, Masahiro: *See—*
Maeda, Takeshi; Mizoguchi, Yasumitsu; Takasago, Masahiro; Kaneda, Tokuya; and Tsunoda, Yoshito, 4,523,089, Cl. 250-205.000.

Takeda Riken Co., Ltd.: *See—*
Hayashi, Mishio, 4,523,288, Cl. 364-569.000.
Takeuchi, Kunio, 4,523,312, Cl. 371-1.000.

Takenaka, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Trunk storage system for small vehicles. 4,522,442, Cl. 296-37.100.

Takenoya, Hideaki; Fujimura, Toshiro; Hara, Masanori; and Tonomura, Yoshinobu, to Janome Sewing Machine Co. Ltd. Method of producing stitch patterns in an electronic sewing machine. 4,522,137, Cl. 112-266.100.

Takenoya, Hideaki; and Inamori, Mikio, to Janome Sewing Machine Industry Co., Ltd. Method of preparing intercharacter control data for use in sewing machines. 4,522,138, Cl. 112-266.100.

Takenoya, Hideaki; and Mishima, Fumiyuki, to Janome Sewing Machine Co. Ltd. Device for adjusting printing paper tension in a printer. 4,522,520, Cl. 400-636.100.

Takenoya, Hideaki: *See—*
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Takeuchi, Akira: *See—*
Aoyama, Youichi; Takeuchi, Akira; Ohmuro, Masaru; and Ichimura, Yasuo, 4,523,164, Cl. 335-38.000.

Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device. 4,522,108, Cl. 91-376.00R.

Takeuchi, Kunio, to Takeda Riken Co., Ltd. IC tester. 4,523,312, Cl. 371-1.000.

Takeuchi, Nobuo: *See—*
Nishimura, Hirofumi; Oda, Hiroyuki; Kaneko, Tadashi; Takai, Akira; and Takeuchi, Nobuo, 4,522,179, Cl. 123-481.000.

Takeuchi, Tomomitsu: *See—*
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Tsutsui, Toshio; Nakagawa, Takao; and Miwa, Shigeru, 4,522,627, Cl. 44-1.00R.

Takeuchi, Tsunezo: *See—*
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Takezawa, Kuninori: *See—*
Inoue, Toshitsugu; Nakada, Akiyoshi; Kaji, Haruo; Doi, Makoto; and Takezawa, Kuninori, 4,522,555, Cl. 414-733.000.

Takimoto, Masahiro; and Ota, Satoshi, to Toyoda Gosei Co., Ltd. Steering wheel for a vehicle. 4,522,084, Cl. 74-557.000.

Tallant, James C., II, to RCA Corporation. Automatic bias control system with compensated sense point. 4,523,233, Cl. 358-242.000.

Tamagawa, Akira; and Kano, Tokio, to Olympus Optical Co., Ltd. Partial injection apparatus. 4,522,493, Cl. 356-36.000.

Tamura, Paul S.; and Strehlow, Robert J., to Oximetrix, Inc. Controller for resistive heating element. 4,523,084, Cl. 219-497.000.

Tamura, Takasi: *See —*
Saito, Sigeru; Shimizu, Takahiko; and Tamura, Takasi, 4,522,525, Cl. 401-258.000.

Tamura, Yukio; Kaminishi, Masashi; and Kato, Yutaka, to Kabushiki Kaisha Komatsu Seisakusho. Track-type vehicle undercarriage. 4,522,451, Cl. 305-18.000.

Tanabe, Eizo: *See—*
Kina, Hideki; Iijima, Toshiyuji; Tanabe, Eizo; Kazama, Toyoki; and Namba, Masaharu, 4,522,904, Cl. 430-54.000.

Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Rotational direction and angle detecting apparatus. 4,523,195, Cl. 340-870.370.

Tanaka, Yasuhito: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,523,011, Cl. 544-238.000.

Tang, Robert H., to PPG Industries, Inc. Method for polymerizing ethylenically unsaturated monomer with novel organic percarbonates. 4,522,991, Cl. 526-230.500.

Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; Fujikawa, Kazuhiko; and Tsumiyama, Takatoshi, to Shin Nisso Kako Co., Ltd. Process for purifying phosphonitrile chlorides. 4,522,689, Cl. 203-52.000.

Tanizawa, Tetsu; Omichi, Hitoshi; and Mitono, Yoshiharu, to Fujitsu Limited. Integrated circuit having predetermined outer to inner cell pitch ratio. 4,523,106, Cl. 307-303.000.

Tarquinio, William R. Golf practice game. 4,522,406, Cl. 273-197.00A.

Tartaglino, Jerry J. Selective zone isolation for HVAC system. 4,522,116, Cl. 98-39.100.

Tateno, Shinya: *See—*
Akihama, Shigeyuki; Koizumi, Hajime; Umeki, Yoshihiko; Saito, Makoto; Banno, Tadashi; and Tateno, Shinya, 4,522,003, Cl. 52-391.000.

Taylor, Edward S.; and Bengtsson, Leif W., to Pyropower Corporation. Fluidized bed combustion boiler. 4,522,154, Cl. 122-4.00D.

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Tazaki, Saburo; and Ide, Akifumi, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for producing a binary information for an information transmission. 4,523,181, Cl. 340-347.0DD.

TechMark Corporation: *See—*
Dyer, David; and Wise, James L., 4,522,035, Cl. 62-79.000.

Tektronix, Inc.: *See—*
Miles, Frank, 4,523,161, Cl. 333-81.00R.

Teleflora, Inc.: *See—*
Murray, John F., 4,521,990, Cl. 47-41.120.

Tennent, David L.; and Sharma, Bhavender P., to Corning Glass Works. Immobilized enzyme composite/process using a mica carrier. 4,522,924, Cl. 501-2.000.

Terada, Yasuo: *See—*
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Terada, Yumiko: *See—*
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Tetra Pak Developpement SA: *See—*
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Texaco Inc.: *See—*
Cuscurida, Michael; and Klein, Howard P., 4,523,025, Cl. 560-26.000.
Mourao, Antonio M.; and Faist, Clifford H., 4,522,631, Cl. 44-57.000.

Texas Instruments Incorporated: *See—*
Westphal, Glenn H.; and Sherer, Jimmie B., 4,522,791, Cl. 422-249.000.

Thacker, Gary W. Self aligning crop spraying apparatus. 4,521,988, Cl. 47-1.700.

Thakoor, Anilkumar P.: *See—*
Khanna, Satish K.; Thakoor, Anilkumar P.; and Williams, Roger M., 4,522,844, Cl. 427-38.000.

Therma-Wave, Inc.: *See—*
Rosencwaig, Allan; and Opsal, Jon, 4,522,510, Cl. 374-7.000.

Thermal Profiles, Inc.: *See—*
Sayer, Bertram; and Kulkaski, Bernard J., 4,521,991, Cl. 49-161.000.

Thermedics, Inc.: *See—*
Szycher, Michael, 4,523,005, Cl. 528-76.000.

Therrien, Roger H., to NCR Canada Ltd - NCR Canada Ltee. Method and system for automatically detecting camera picture element failure. 4,523,231, Cl. 358-139.000.

Thim, Stig, to A-Betong AB; and Sabema Material AB. Matrix array for manufacturing concrete sleeper blocks. 4,522,367, Cl. 249-86.000.

Thissen, Christopher P., to Walker Process Corporation. Water treatment apparatus. 4,522,714, Cl. 210-150.000.

Thomas & Betts Corporation: *See—*
Greenwood, William S., 4,521,969, Cl. 33-180.00R.

Thomas, John E., to Tippins Machinery Company, Inc. Three stand mini mill method and apparatus. 4,522,050, Cl. 72-229.000.

Thomas, Richard C., to Upjohn Company, The. Analogs of the antibiotic spectinomycin. 4,523,022, Cl. 549-354.000.

Thomas, Samuel J.; Robich, James M.; and Hayes, Robert L., to Kendall Company, The. Pipe coating. 4,523,141, Cl. 324-54.000.

Thompson, Philip A.: *See—*
Meier, Gerd E. A.; and Thompson, Philip A., 4,522,183, Cl. 123-558.000.

Thompson, R. Bruce, to United States of America, Energy. Method and apparatus for measuring stress. 4,522,071, Cl. 73-597.000.

Thompson, Robert E.; Gould, Gordon; and Soodak, Charles I., to Chevron Research Company. Armored cable containing a hermetically sealed tube incorporating an optical fiber. 4,522,464, Cl. 350-96.230.

Thompson, Timothy H.: *See—*
Bauers, Barton M.; Raudat, John L.; Ehlers, Raymond C.; and Thompson, Timothy H., 4,522,011, Cl. 53-55.000.

Thomsen, Bernard D.; and Thomsen, Kenneth L. Transverse joint cell for concrete structures. 4,522,531, Cl. 404-2.000.

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Thomson-CSF: *See—*
Croset, Michel; and Mercandalli, Louis, 4,521,951, Cl. 29-571.000.
Houdart, Michel; Arruberrenal, Edouard; and Maurette, Frederic, 4,523,163, Cl. 333-218.000.

Thomson-Leeds Company, Inc.: *See—*
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Thorsson, Conny R.; and Viira, Indrek J., to Alfa-Laval AB. Production of ethanol. 4,522,920, Cl. 435-161.000.

Tiberend, Harvey L. Hay bale cover. 4,521,997, Cl. 52-3.000.

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Tillotson, Harry T.: *See—*
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Timm, Gerald W.; Sandford, Donald L.; Claude, Timothy J.; and Helms, Richard A., to Dacomed Corporation. Penile prosthesis. 4,522,198, Cl. 128-79.000.

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Tocci, Leonard R., to Rockwell International Corporation. Chevron detector expander for magnetic bubble domain system. 4,523,300, Cl. 365-43.000.
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Toda, Yoshihide: *See—*
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Todd, Julian B.; and Webb, Roger J. Heat regenerator. 4,522,588, Cl. 432-181.000.
Toffolon, Joseph F., to Progressive Machinery Sales, Inc. Bar puller. 4,522,091, Cl. 82-38.00R.
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Toivio, Ilkka; and Toivio, Terttu. Device for the improving of the starting of an engine. 4,522,166, Cl. 123-196.00A.
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Toivio, Ilkka; and Toivio, Terttu, 4,522,166, Cl. 123-196.00A.
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Misawa, Norio, 4,522,487, Cl. 355-15.000.
Noma, Akira, 4,523,098, Cl. 250-492.200.
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Tompkins, Terry C.: *See—*
Checak, Nicholas J.; McKean, Dennis R.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., 4,522,911, Cl. 430-192.000.
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Tone, Masayuki; Yano, Tsutomu; and Saito, Koetsu, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ultrasonic transducers having acoustic impedance-matching layers. 4,523,122, Cl. 310-334.000.
Tongue, John R. Orthopedic surgery drill guide apparatus. 4,522,201, Cl. 128-92.0EB.
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Toshimitsu, Naohiko; and Fujimura, Masayuki, to Canon Denshi Kabushiki Kaisha. Magnetic head. 4,523,244, Cl. 360-129.000.
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Toyoda Gosei Co., Ltd.: *See—*
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Trilli, Pat. Conveyor system and method for randomly transporting card racks to gambling tables. 4,522,400, Cl. 273-148.00A.
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Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Image scanning system with signal integration time control. 4,523,101, Cl. 250-578.000.
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Gardner, Hugh C., 4,522,978, Cl. 525-48.000.
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Wolff, James W.; Ruedisueli, James W.; and Schinke, Ralph, to Union Special Corporation. Method and apparatus for retarding oil leakage in a sewing machine. 4,522,136, Cl. 112-256.000.
Wolfseder, Alfons, to Anton Steinecker Maschinenfabrik GmbH. Apparatus for the extraction of vapor from a mash and/or wort tub. 4,522,256, Cl. 165-103.000.
Wolfseder, Alfons, to Anton Steinecker Maschinenfabrik GmbH. Tub vapor condenser. 4,522,257, Cl. 165-113.000.
Wong, Harvey C., to Mechatron Systems, Inc. Dual mode printer servo with improved velocity signal generator. 4,523,137, Cl. 318-604.000.
Wood, Robin: *See—*
Brittain, David R.; and Wood, Robin, 4,523,021, Cl. 548-410.000.
Woodcock, Sidney H.; Maes, Michel E.; and Steimel, Ronald W., to Detonics Pistol Accessories Ltd. Shock-absorbing recoil mechanism. 4,522,107, Cl. 89-196.000.
Woodruff, Richard E.; and Silliker, John H., to TransFRESH Corporation. Process and composition for producing and maintaining good color in fresh meat, fresh poultry and fresh fish. 4,522,835, Cl. 426-264.000.
World Color Press, Inc.: *See—*
Beckley, Robert A., 4,522,384, Cl. 270-54.000.
Worthington, Paul A., to Imperial Chemical Industries PLC. 1,3-Bis(-triazolyl)propan-2-one. 4,523,019, Cl. 548-262.000.
Worthington, Roy. Collapsible tea cart. 4,522,130, Cl. 108-159.000.
Wright, Geoff C.: *See—*
Small, Edward A.; and Wright, Geoff C., 4,522,428, Cl. 283-82.000.
Wuerzer, Bruno: *See—*
Markert, Jurgen; Hagen, Helmut; and Wuerzer, Bruno, 4,522,646, Cl. 71-94.000.
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,523,034, Cl. 564-79.000.
Wujcik, Steven E.: *See—*
Grace, Oscar M.; Wujcik, Steven E.; and Heyman, Duane A., 4,522,976, Cl. 524-722.000.
Wunder, Friedrich: *See—*
Baltes, Herbert; Litterer, Heinz; Leupold, Ernst I.; and Wunder, Friedrich, 4,522,800, Cl. 423-329.000.
Wyffels, Michael K.: *See—*
Nelson, Leon F.; Montgomery, Dan T.; Wyffels, Michael K.; and Sikula, William J., Jr., 4,522,553, Cl. 414-526.000.
Xerox Corporation: *See—*
Donohue, James M.; Markle, Robert E.; and Mager, George E., 4,523,299, Cl. 364-900.000.
Fisher, Almon P., 4,522,488, Cl. 355-15.000.
Tabares, Gilbert, 4,522,365, Cl. 248-466.000.
Yanus, John F., 4,523,035, Cl. 564-307.000.
Yagishita, Teruo: *See—*
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,522,909, Cl. 430-137.000.
Yamada, Masanori; and Yoshikawa, Ryoichi, to Canon Kabushiki Kaisha. Flash apparatus with power supply control device. 4,522,479, Cl. 354-413.000.
Yamada, Yoshichika: *See—*
Yano, Kiyotoshi; Suzuki, Yutaka; and Yamada, Yoshichika, 4,522,372, Cl. 251-141.000.
Yamagiwa, Tamio, to Hi-Sonic Co., Ltd. Valve for automatic stoppage of water supply. 4,522,226, Cl. 137-390.000.
Yamaguchi, Shinji: *See—*
Akagi, Takao; Yamaguchi, Shinji; and Kubotsu, Akira, 4,522,873, Cl. 428-283.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Okazaki, Masaki, 4,522,602, Cl. 440-77.000.
Yamamoto, Hiroshi, 4,522,282, Cl. 180-219.000.
Yamamori, Shinji: *See—*
Kurahashi, Muneshige; and Yamamori, Shinji, 4,522,204, Cl. 128-719.000.
Yamamoto, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust system for motorcycle. 4,522,282, Cl. 180-219.000.
Yamamoto, Ichiro: *See—*
Asao, Yasuzi; and Yamamoto, Ichiro, 4,522,906, Cl. 430-60.000.
Yamamoto Kagaku Gosei Co., Ltd.: *See—*
Kumagae, Yojiro; and Iwasaki, Yasuhisa, 4,523,018, Cl. 546-315.000.
Yamamoto, Keisuke: *See—*
Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; Yamamoto, Keisuke; and Yasumoto, Yoshio, 4,523,225, Cl. 358-56.000.
Yamamoto, Takeshi: *See—*
Iwaki, Akio; Suzuki, Norihito; Yamamoto, Takeshi; and Aoki, Toru, 4,522,891, Cl. 428-626.000.
Yamamoto, Taku: *See—*
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,522,567, Cl. 417-270.000.
Yamato Scale Company, Limited: *See—*
Kinoshita, Kinjiro, 4,522,321, Cl. 222-504.000.
Yamato Scientific Co., Ltd.: *See—*
Saito, Tatsuhiko, 4,522,684, Cl. 159-11.200.
Yamatsu, Isao; Suzuki, Takeshi; Abe, Shinya; Kajiwara, Akiharu; and Ota, Kiichiro, to Eisai Co., Ltd. Polyprenylcarboxylic acid amides. 4,522,759, Cl. 260-404.000.
Yamazaki, Susumu: *See—*
Ochiai, Hideo; Nagoya, Yoshinari; Fujimoto, Ryoichi; Yamazaki, Susumu; Sasamoto, Nobuhiko; and Ishida, Shinichi, 4,522,040, Cl. 62-419.000.
Yan, Tsoung Y.; and Chen, Nai Y., to Mobil Oil Corporation. Thermal treatment of heavy hydrocarbon oil. 4,522,703, Cl. 208-106.000.
Yang, Swe-Wong: *See—*
Gigliotti, Michael F. X., Jr.; Yang, Swe-Wong; Jackson, Melvin R.; Bruch, Charles A.; and Nguyen-Dinh, Xuan, 4,522,664, Cl. 148-404.000.
Yannas, Ioannis V.; Burke, John F.; and Stasikelis, Peter J., to Massachusetts Institute of Technology. Method for preserving porosity in porous materials. 4,522,753, Cl. 260-123.700.
Yano, Kiyotoshi; Suzuki, Yutaka; and Yamada, Yoshichika, to Nippondenso Co., Ltd. Electromagnetic valve. 4,522,372, Cl. 251-141.000.
Yano, Takeshi: *See—*
Takahashi, Sadayuki; Yonezawa, Masatomo; Ochi, Atsushi; Yano, Takeshi; Hamatsuki, Takeshige; and Fukui, Izumu, 4,523,121, Cl. 310-334.000.
Yano, Tsutomu: *See—*
Tone, Masayuki; Yano, Tsutomu; and Saito, Koetsu, 4,523,122, Cl. 310-334.000.
Yanus, John F., to Xerox Corporation. Process for synthesizing squaraine compositions. 4,523,035, Cl. 564-307.000.
Yarrington, Robert M.: *See—*
Hwang, Herng-Shinn; Heck, Ronald M.; and Yarrington, Robert M., 4,522,894, Cl. 429-17.000.
Yarwood, John C.: *See—*
Ungarean, Gary L.; and Yarwood, John C., 4,522,247, Cl. 164-150.000.
Yasuda, Makoto; and Murayama, Seiichi, to Hitachi, Ltd. Liquid chromatography apparatus. 4,523,096, Cl. 250-373.000.
Yasuda, Yoshiko: *See—*
Kazufumi, Ogawa; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,523,102, Cl. 250-578.000.
Yasui, Taro. Slips. 4,522,427, Cl. 281-5.000.
Yasumoto, Yoshio: *See—*
Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; Yamamoto, Keisuke; and Yasumoto, Yoshio, 4,523,225, Cl. 358-56.000.
Yates, Donald N., Jr.; and Oestrich, Michael, to GEO Vann, Inc. Primer mix, percussion primer and method for initiating combustion. 4,522,665, Cl. 149-21.000.
Yeh, Chun T. Automatic cassette ejecting device. 4,522,353, Cl. 242-198.000.
Yen, Teh F.; and Chan, Mankin, to University of Southern California. Method for fracturing of oil shale. 4,522,265, Cl. 166-307.000.
Yeo, Herbert G.: *See—*
Petersen, Richard W.; Pierini, John M.; and Yeo, Herbert G., 4,522,053, Cl. 720-316.000.
Yessian, Richard J.; and Oetting, William A., to Lockheed Electronics Company, Inc. Motor differential drive reel tensioning system. 4,522,351, Cl. 242-189.000.
Yokogawa, Akira; Takahashi, Asao; Maruyama, Isao; and Hosaka, Takao, to Maruzen Petrochemical Co., Ltd. Process for recovery of cyclopentadienes. 4,522,688, Cl. 203-28.000.
Yokoyama, Naoki: *See—*
Hasebe, Nobuhisa; Kawada, Hiroshi; Yokoyama, Naoki; and Komori, Shigeki, 4,522,540, Cl. 409-293.000.
Yokoyama, Nobuaki: *See—*
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,523,197, Cl. 343-702.000.
Yonezawa, Masatomo: *See—*
Takahashi, Sadayuki; Yonezawa, Masatomo; Ochi, Atsushi; Yano, Takeshi; Hamatsuki, Takeshige; and Fukui, Izumu, 4,523,121, Cl. 310-334.000.
Yonezawa, Taketoshi: *See—*
Kazufumi, Ogawa; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,523,102, Cl. 250-578.000.

Yoo, Byung E. Boat. 4,522,601, Cl. 440-11.000.

Yoo, Jin S.; Karch, John A.; Poss, Richard F.; and Burk, Emmett H., Jr., to Atlantic Richfield Company. Preparative process for alkaline earth metal, aluminum-containing spinels. 4,522,937, Cl. 502-302.000.

Yoshida, Kenji; and Sanada, Yuichi, to Nissan Motor Company, Limited. Rack and pinion type steering device. 4,522,419, Cl. 280-96.000.

Yoshida Kogyo K. K.: *See*—
Oda, Kiyoshi, 4,521,942, Cl. 24-419.000.

Yoshida, Masakazu: *See*—
Kawai, Hisasi; Ina, Toshikazu; Igashira, Toshihiko; Nomura, Ken; Yoshida, Masakazu; Komoda, Takao; and Hamanishi, Makio, 4,522,177, Cl. 123-478.000.

Yoshida, Motoaki: *See*—
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, 4,522,966, Cl. 524-114.000.

Yoshida, Tomio: *See*—
Satoh, Isao; Yoshida, Tomio; Harigae, Shunji; and Koishi, Kenji, 4,523,304, Cl. 369-32.000.

Yoshikawa, Ryoichi: *See*—
Yamada, Masanori; and Yoshikawa, Ryoichi, 4,522,479, Cl. 354-413.000.

Yoshimitsu, Yasuro: *See*—
Okubo, Masao; and Yoshimitsu, Yasuro, 4,523,144, Cl. 324-158.00P.

Yoshinari, Osamu; Kawakatsu, Yoshifumi; and Fukuizumi, Hideaki, to Toho Beslon Co., Ltd. Process for producing carbon fiber or graphite fiber. 4,522,801, Cl. 423-447.400.

Yoshitake, Hideki: *See*—
Kinoshita, Hisashi; Yoshitake, Hideki; and Kake, Nin, 4,523,134, Cl. 318-313.000.

Young, Donald C., to Union Oil Company of California. Method for selectively controlling plant suckers. 4,522,644, Cl. 71-78.000.

Young, Iain M.: *See*—
Whatmore, Roger W.; and Young, Iain M., 4,523,119, Cl. 310-313.00A.

Yurchak, Sergei: *See*—
Gould, Ronald M.; and Yurchak, Sergei, 4,523,046, Cl. 585-322.000.

Zansky, Zoltan, to Honeywell Inc. Dimmable electronic gas discharge lamp ballast. 4,523,131, Cl. 315-307.000.

Zansky, Zoltan: *See*—
Stamm, Thomas A.; and Zansky, Zoltan, 4,523,128, Cl. 315-291.000.

Zato, Thomas J., to Zenith Electronics Corporation. Power loss compensation for programmable memory control system. 4,523,295, Cl. 364-900.000.

Zaugg, Paul, to BBC Brown, Boveri & Company, Limited. Method for reducing the amount of nox and for raising the output of a gas turbine power station of the type utilizing an air reservoir, and a gas turbine power station, of this type, operating in accordance with this method. 4,522,024, Cl. 60-39.050.

Zeigler, Theodore R. Clip for self-locking collapsible/expandable structures. 4,522,008, Cl. 52-646.000.

Zeitelhack, Arthur R. Pencil holder. 4,522,522, Cl. 401-88.000.

Zelinkovsky, Reuven: *See*—
Piasecki, Joshua; Zelinkovsky, Reuven; Segev, Aharon; and Henquin, Teodor, 4,523,309, Cl. 370-81.000.

Zemco, Inc.: *See*—
Blaney, Peter G., 4,522,280, Cl. 180-175.000.

Zendler, Richard: *See*—
Maack, Werner; and Zendler, Richard, 4,521,960, Cl. 29-749.000.

Zengel, Hans: *See*—
Klostermeier, Werner; Lasher, Jeffery D.; Meyer, Gerhard; and Zengel, Hans, 4,522,880, Cl. 428-332.000.

Zenith Electronics Corporation: *See*—
Dobrovolny, Pierre, 4,523,159, Cl. 331-99.000.
Zato, Thomas J., 4,523,295, Cl. 364-900.000.

Zieke, Larry M., to Dow Chemical Company, The. Transversely adjustable profile die block. 4,522,678, Cl. 156-501.000.

Ziemiak, John J.: *See*—
McVicker, Gary B.; Carter, James L.; Murrell, Lawrence L.; and Ziemiak, John J., 4,522,928, Cl. 502-26.000.

Zimmer, James E.: *See*—
Wallace, Gary A.; and Zimmer, James E., 4,522,883, Cl. 428-365.000.

Zimmerer, Robert W., to Scientech, Inc. Method and apparatus for measuring radiant energy. 4,522,511, Cl. 374-32.000.

Zirkl, Siegmar, to Siemens Aktiengesellschaft. Electronic time switch. 4,523,103, Cl. 307-141.000.

Zoche, Gunter: *See*—
Neuschaffer, Karl-Heinz; Engels, Hans-Werner; Gebert, Hans-Jurgen; Laube, Robert W.; and Zoche, Gunter, 4,522,652, Cl. 106-84.000.

Zoecon Corporation: *See*—
Anderson, Richard J.; and Lee, Shy-Fuh, 4,522,647, Cl. 71-94.000.

434743 Ontario Inc.: *See*—
Clark, George W.; and Keene, Christopher B., 4,522,299, Cl. 206-315.300.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JUNE, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barger, William M., to French Oil Mill Machinery Company, The. Apparatus for the continuous extraction of oils and soluble substances from solid materials. Re. 31,913, Cl. 422-267.000.

Cosden Technology, Inc.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., Re. 31,912, Cl. 156-494.000.

Fortuna, Vincent E.; and MacLaughlin, Donald N., to Cosden Technology, Inc. Inertial spin welding of thermoplastic and thermoplastic coated container parts. Re. 31,912, Cl. 156-494.000.

French Oil Mill Machinery Company, The: *See*—
Barger, William M., Re. 31,913, Cl. 422-267.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerated display case having ambient air defrost. Re. 31,909, Cl. 62-82.000.

Jidosha Kiki Co., Ltd.: *See*—
Ohta, Ryuji; and Kobayashi, Michio, Re. 31,911, Cl. 92-98.00D.

Kobayashi, Michio: *See*—
Ohta, Ryuji; and Kobayashi, Michio, Re. 31,911, Cl. 92-98.00D.

MacLaughlin, Donald N.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., Re. 31,912, Cl. 156-494.000.

Medeco Security Locks, Inc.: *See*—
Oliver, Roy N., Re. 31,910, Cl. 70-369.000.

Ohta, Ryuji; and Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Coupled shells for vacuum power servo booster. Re. 31,911, Cl. 92-98.00D.

Oliver, Roy N., to Medeco Security Locks, Inc. Removable core cylinder lock. Re. 31,910, Cl. 70-369.000.

Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., Re. 31,909, Cl. 62-82.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ateliers des Charmilles, S.A.: *See*—
Convers, Danielle; Balleys, Francois; and Pfau, Jean, B1 4,287,404, Cl. 219-69.00W.

Balleys, Francois: *See*—
Convers, Danielle; Balleys, Francois; and Pfau, Jean, B1 4,287,404, Cl. 219-69.00W.

Convers, Danielle; Balleys, Francois; and Pfau, Jean, to Ateliers des Charmilles, S.A. Electrode for electrical discharge machining. B1 4,287,404, 6-11-85, Cl. 219-69.00W.

Data Display Systems, Inc.: *See*—
Levitt, Joseph R., B1 3,602,706, Cl. 364-551.000.

Gulistan, Bulent, to VSI Corporation. Panel fastener. B1 4,285,380, 6-11-85, Cl. 411-103.000.

Levitt, Joseph R., to Data Display Systems, Inc. Data-processing method and means for classifying signals in a first or second state. B1 3,602,706, 6-11-85, Cl. 364-551.000.

Pfau, Jean: *See*—
Convers, Danielle; Balleys, Francois; and Pfau, Jean, B1 4,287,404, Cl. 219-69.00W.

VSI Corporation: *See*—
Gulistan, Bulent, B1 4,285,380, Cl. 411-103.000.

LIST OF DESIGN PATENTEES

Allen, James H., to 'totes', incorporated. Expandable hang-up garment bag. 279,144, 6-11-85, Cl. D3-71.000.

American Tourister, Inc.: *See*—
Pulichino, John; Bomes, Harvey J.; Migliore, John J.; Smith, Lonnie M.; and Schmitt, Wayne, 279,142, Cl. D3-71.000.

Aronowitz, Robert J.; and Katzanek, Bernard D., to Samsonite Corporation. Armrest. 279,153, 6-11-85, Cl. D6-501.000.

Aronowitz, Robert J.; and Katzanek, Bernard D., to Samsonite Corporation. Combined seat and backrest unit. 279,154, 6-11-85, Cl. D6-501.000.

Aronowitz, Robert J.; and Katzanek, Bernard D., to Samsonite Corporation. Combined seat and backrest unit. 279,155, 6-11-85, Cl. D6-501.000.

Artsana S.P.A.: *See*—
Catelli, Pietro, 279,204, Cl. D21-124.000.
Catelli, Pietro, 279,205, Cl. D21-127.000.

Asaji, Toshio: *See*—
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, 279,187, Cl. D14-100.000.
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, 279,189, Cl. D14-113.000.

AT&T Bell Laboratories: *See*—
Felix, Christian J.; Gates, Frank V.; and Sylvester, Gordon E., 279,185, Cl. D14-60.000.

Avon Tyres Limited: *See*—
Walker, Peter J., 279,177, Cl. D12-136.000.

Banasik, Wayne R. Dispensing closure. 279,169, 6-11-85, Cl. D9-447.000.

Belotta, Anthony S., to Warner-Lambert Company. Combined display rack and shelf unit. 279,150, 6-11-85, Cl. D6-462.000.

Bomes, Harvey J.: *See*—
Pulichino, John; Bomes, Harvey J.; Migliore, John J.; Smith, Lonnie M.; and Schmitt, Wayne, 279,142, Cl. D3-71.000.

Bounds, William E. Condiment dispenser. 279,158, 6-11-85, Cl. D7-54.000.

Bounds, William E. Condiment dispenser. 279,159, 6-11-85, Cl. D7-57.000.

Brian Davis and Company Proprietary Limited: *See*—
Carlson, Arthur R., 279,210, Cl. D23-11.000.
Carlson, Arthur R., 279,211, Cl. D23-11.000.
Carlson, Arthur R., 279,212, Cl. D23-11.000.

Bridgestone Tire Co., Ltd.: *See*—
Nakamura, Masao; Kojima, Hiroshi; and Nishio, Hideaki, 279,178, Cl. D12-151.000.

Canyon Corporation: *See*—
Tada, Tetsuya, 279,166, Cl. D9-300.000.

Carlson, Arthur R., to Brian Davis and Company Proprietary Limited. Watering can. 279,210, 6-11-85, Cl. D23-11.000.

Carlson, Arthur R., to Brian Davis and Company Proprietary Limited. Watering can. 279,211, 6-11-85, Cl. D23-11.000.

Carlson, Arthur R., to Brian Davis and Company Proprietary Limited. Watering can. 279,212, 6-11-85, Cl. D23-11.000.

Carpel, Emmett F. Multiple nipple pacifier. 279,218, 6-11-85, Cl. D24-46.000.

Catelli, Pietro, to Artsana S.P.A. Toy cash register. 279,204, 6-11-85, Cl. D21-124.000.

Catelli, Pietro, to Artsana S.P.A. Toy typewriter. 279,205, 6-11-85, Cl. D21-127.000.

Chevassus, Alain, to Lefebure Isolants Reunis. Cosmetic box. 279,225, 6-11-85, Cl. D28-83.000.

Chi Hung, Danny C., to Dah Sun Electronics Company Limited. Calculator clip. 279,197, 6-11-85, Cl. D18-2.000.
Claxton, Bruce A.; and Ramos, Sylvia, to Motorola, Inc. Portable battery charger or similar article. 279,181, 6-11-85, Cl. D13-5.000.
Coats & Clark, Inc.: *See—*
Dunn, James R., 279,200, Cl. D19-91.000.
Command Concept Company: *See—*
Florsek, Mary E., 279,147, Cl. D6-422.000.
Florsek, Mary E., 279,148, Cl. D6-432.000.
Florsek, Mary E., 279,149, Cl. D6-444.000.
Cox, Clifford C.: *See—*
Truitt, Robert B.; Cox, Clifford C.; and Manno, Joseph J., 279,217, Cl. D24-17.000.
Dah Sun Electronics Company Limited: *See—*
Chi Hung, Danny C., 279,197, Cl. D18-2.000.
Dole, Charles M.: *See—*
Schosser, John F.; Dole, Charles M.; and Koda, Walter P., 279,221, Cl. D26-44.000.
Drane, John H., to Duracell Inc. Portable light. 279,222, 6-11-85, Cl. D26-44.000.
Dunn, James R., to Coats & Clark, Inc. Recipe memo holder. 279,200, 6-11-85, Cl. D19-91.000.
Duracell Inc.: *See—*
Drane, John H., 279,222, Cl. D26-44.000.
Schosser, John F.; Dole, Charles M.; and Koda, Walter P., 279,221, Cl. D26-44.000.
Eastern Electrical Equipment Co., Inc.: *See—*
Shuman, Bernard E., 279,201, Cl. D20-43.000.
Eklof, Krister. Water reservoir for potted plants. 279,175, 6-11-85, Cl. D11-164.000.
Erica Goldsmith Trust: *See—*
Goldsmith, David, 279,168, Cl. D9-429.000.
Esselte Dymo N V: *See—*
Pedersen, Dane, 279,198, Cl. D18-19.000.
Evan Goldsmith Trust: *See—*
Goldsmith, David, 279,168, Cl. D9-429.000.
F.lli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 279,157, Cl. D7-48.000.
Felix, Christian J.; Gates, Frank V.; and Sylvester, Gordon E., to AT&T Bell Laboratories. Stand for a telephone or similar article. 279,185, 6-11-85, Cl. D14-60.000.
Fletcher, Robert, to Paramount Pictures Corporation. Costume. 279,135, 6-11-85, Cl. D2-30.000.
Florsek, Mary E., to Command Concept Company. Receptionist desk. 279,147, 6-11-85, Cl. D6-422.000.
Florsek, Mary E., to Command Concept Company. Hair care unit. 279,148, 6-11-85, Cl. D6-432.000.
Florsek, Mary E., to Command Concept Company. Hair care unit. 279,149, 6-11-85, Cl. D6-444.000.
Ford Motor Company: *See—*
Shenk, William B., Jr., 279,182, Cl. D14-1.000.
Freeman, Jack A. Swimming pool. 279,220, 6-11-85, Cl. D25-2.000.
Fuji Co., Ltd.: *See—*
Ueda, Taichi, 279,143, Cl. D3-71.000.
Fujitsu Limited: *See—*
Nakamura, Tadashi; and Nakano, Yutaka, 279,191, Cl. D14-100.000.
G. R. Marketing, Inc.: *See—*
Wolfberg, Gary R., 279,174, Cl. D11-47.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Athletic shoe with pocket. 279,138, 6-11-85, Cl. D2-309.000.
Gamm, Robert J., to Kangaroos U.S.A. Inc. Athletic shoe. 279,139, 6-11-85, Cl. D2-310.000.
Gates, Frank V.: *See—*
Felix, Christian J.; Gates, Frank V.; and Sylvester, Gordon E., 279,185, Cl. D14-60.000.
Gecchelin, Bruno, to F.lli Guzzini S.p.A. Citrus-fruit squeezer. 279,157, 6-11-85, Cl. D7-48.000.
Gerber Products Company: *See—*
Mango, Joseph R.; and Wolfe, Donald G., 279,215, Cl. D23-146.000.
Mango, Joseph R.; and Wolfe, Donald G., 279,216, Cl. D23-148.000.
Goldsmith, David, to Erica Goldsmith Trust; and Evan Goldsmith Trust. Packaging container or the like. 279,168, 6-11-85, Cl. D9-429.000.
Gould, Mel J. Hand-held gripping tool for cooking utensils. 279,161, 6-11-85, Cl. D7-393.000.
Hand, John. Foam-head shuttlecock. 279,207, 6-11-85, Cl. D21-207.000.
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344	4,522,143
348	4,522,144
352	4,522,145

CLASS 116

2	4,522,146
216	4,522,147

CLASS 118

405	4,522,148
725	4,522,149

CLASS 119

1	4,522,150
3	4,522,151
56 R	4,522,152
109	4,522,153

CLASS 122

4 D	4,522,154
7 R	4,522,155
34	4,522,156
510	4,522,157

CLASS 123

1 A	4,522,158
	4,522,159
41.49	4,522,160
41.85	4,522,161
46.5 C	4,522,162
73 F	4,522,163
180 R	4,522,164
195 C	4,522,165
196 A	4,522,166
196 S	4,522,167
198 D	4,522,168
198 DC	4,522,170
198 F	4,522,169
270	4,522,171
276	4,522,172
	4,522,173
300	4,522,174
339	4,522,175
	4,522,176
478	4,522,177
	4,522,178
481	4,522,179
489	4,522,180
502	4,522,181
509	4,522,182
558	4,522,183
599	4,522,184
637	4,522,185
643	4,522,186

CLASS 124

24 A	4,522,187

CLASS 125

11 CC	4,522,188
11 TP	4,522,189

CLASS 126

263	4,522,190
307 R	4,522,191
343.5 A	4,522,192
438	4,522,193

CLASS 128

1 D	4,522,194
	4,522,195
4	4,522,196
26	4,522,197
79	4,522,198
80 G	4,522,199
92 BC	4,522,200
	4,522,202
92 EB	4,522,201
132 D	4,522,203
303.17	4,522,205
312	4,522,206
325	4,522,207
419 PT	4,522,208
419 R	4,522,209
421	4,522,210
640	4,522,211
642	4,522,212
716	4,522,213
719	4,522,204

CLASS 131

79	4,522,214

CLASS 132

11 R	4,522,215
92 R	4,522,216

CLASS 134

75	4,522,217

CLASS 136

260	4,523,051

CLASS 137

3	4,522,218
62	4,522,219
85	4,522,220
118	4,522,221
240	4,522,222
	4,522,223
242	4,522,224
351	4,522,225
390	4,522,226
393	4,522,227
	4,522,228
460	4,522,229
496	4,522,230
625.17	4,522,231
625.32	4,522,232
625.47	4,522,233

CLASS 138

108	4,522,234
130	4,522,235

CLASS 139

353	4,522,236

CLASS 141

95	4,522,237
142	4,522,238

CLASS 144

2 Z	4,522,239
193 A	4,522,241
193 E	4,522,240
208 E	4,522,242

CLASS 148

1.5	4,522,656
	4,522,657
6.14 R	4,522,658
11.5 R	4,522,659
20.3	4,522,660
33.2	4,522,661
175	4,522,662
403	4,522,663
404	4,522,664

CLASS 149

21	4,522,665

CLASS 152

528	4,522,243

CLASS 156

69	4,522,666
87	4,522,667
89	4,522,668
157	4,522,669
220	4,522,670
235	4,522,671
238	4,522,672
244.11	4,522,675
307.3	4,522,673
345	4,522,674
443	4,522,676
467	4,522,677
494	Re.31,912
501	4,522,678
510	4,522,679
624	4,522,680
643	4,522,681
647	4,522,682
666	4,522,683

CLASS 159

11.2	4,522,684

CLASS 160

170	4,522,244
177	4,522,245
223	4,522,246

CLASS 162

30.11	4,522,685
158	4,522,686
336	4,522,687

CLASS 164

150	4,522,247
394	4,522,248
466	4,522,249
472	4,522,250

491 4,522,251

CLASS 165

1 4,522,252
18 4,522,253
34 4,522,254
48 R 4,522,255
103 4,522,256
113 4,522,257

CLASS 166

57 4,522,258
237 4,522,259
245 4,522,260
246 4,522,261
248 4,522,262
272 4,522,263
278 4,522,264
307 4,522,265
330 4,522,266

CLASS 172

28 4,522,267
518 4,522,268

CLASS 173

12 4,522,269
163 4,522,270

CLASS 174

16 BH 4,523,052
42 4,523,053
45 R 4,523,054

CLASS 175

56 4,522,271
74 4,522,272
135 4,522,273

CLASS 177

25 4,522,274
4,522,275
145 4,522,276
250 4,522,277

CLASS 179

2 DP 4,523,055
81 B 4,523,057
81 R 4,523,056
84 T 4,523,058

CLASS 180

79.1 4,522,278
143 4,522,279
175 4,522,280
208 4,522,281
219 4,522,282

CLASS 181

175 4,522,283
292 4,522,284

CLASS 187

22 4,522,285

CLASS 188

72.7 4,522,286
73.35 4,522,287

CLASS 190

106 4,522,288

CLASS 191

6 4,523,059

CLASS 192

41 A 4,522,289
107 M 4,522,290

CLASS 193

23 4,522,291

CLASS 198

374 4,522,292
377 4,522,293
429 4,522,294
493 4,522,295
548 4,522,296
774 4,522,297

CLASS 200

5 A 4,523,060
17 R 4,523,061
35 R 4,523,062
61.41 4,523,063
67 D 4,523,064
83 S 4,523,066
157 4,523,065

CLASS 203

28 4,522,688
52 4,522,689

CLASS 204

1 T 4,522,690
18.1 4,522,691
129.5 4,522,692
159.15 4,522,693
159.24 4,522,694
266 4,522,695
297 W 4,522,696
298 4,522,697
301 4,522,698
434 4,522,699

CLASS 206

216 4,522,298
315.3 4,522,299
315.4 4,522,300
507 4,522,301
570 4,522,302
588 4,522,303
591 4,522,304
632 4,522,305

CLASS 208

8 LE 4,522,700
40 4,522,701
89 4,522,702
106 4,522,703
113 4,522,704
120 4,522,705
121 4,522,706
136 4,522,708
180 4,522,707
216 R 4,522,709
349 4,522,710

CLASS 209

298 4,522,711

CLASS 210

86 4,522,712
136 4,522,713
150 4,522,714
198.2 4,522,715
210 4,522,716
238 4,522,717
371 4,522,718
457 4,522,719
512.1 4,522,720
603 4,522,721
605 4,522,722
611 4,522,723
635 4,522,724
639 4,522,725
660 4,522,726
673 4,522,727
714 4,522,728
727 4,522,729
750 4,522,730

CLASS 211

49.1 4,522,306

CLASS 215

219 4,522,307
253 4,522,308

CLASS 219

10.49 R 4,523,067
10.53 4,523,068
10.55 D 4,523,069
10.55 F 4,523,070
56.22 4,523,071
67 4,523,072
69 W 4,523,073
4,523,074
B1 4,287,404
88 4,523,075
125.1 4,523,076
137 PS 4,523,077
202 4,523,078
251 4,523,079
362 4,523,080
370 4,523,081
399 4,523,082
433 4,523,083
497 4,523,084
528 4,523,085
549 4,523,086

CLASS 220

2.1 A 4,522,309
4 R 4,522,310
254 4,522,311
324 4,522,312

CLASS 221

1 4,522,313
190 4,522,314

CLASS 222

142.1 4,522,315
327 4,522,316
391 4,522,317
402.24 4,522,318
481.5 4,522,319
484 4,522,320
504 4,522,321
597 4,522,322

CLASS 223

102 4,522,324

CLASS 224

42.21 4,522,325
310 4,522,326

CLASS 225

2 4,522,323

CLASS 227

19 4,522,327
153 4,522,329

CLASS 228

182 4,522,330
263.18 4,522,331

CLASS 229

43 4,522,332

CLASS 235

379 4,523,087
487 4,523,088

CLASS 236

20 R 4,522,333
34.5 4,522,334
44 C 4,522,335
46 F 4,522,337
46 R 4,522,336

CLASS 239

177.2 4,522,338
272 4,522,339
654 4,522,340
672 4,522,341

CLASS 241

57 4,522,342
58 4,522,343
79 4,522,344

CLASS 242

55 4,522,345
55.3 4,522,346
84.5 A 4,522,347
96 4,522,348
4,522,349
107.4 A 4,522,350
189 4,522,351
193 4,522,352
198 4,522,353
219 4,522,354

CLASS 244

3.15 4,522,356
3.2 4,522,355
3.22 4,522,357
110 B 4,522,358
129.5 4,522,359
204 4,522,360

CLASS 248

188.8 4,522,361
207 4,522,362
225.2 4,522,363
460 4,522,364
466 4,522,365
551 4,522,366

CLASS 249

86 4,522,367

CLASS 250

205 4,523,089
211 K 4,523,090
213 VT 4,523,091
227 4,523,092
234 4,523,093
311 4,523,094
349 4,523,095
373 4,523,096
458.1 4,523,097
492.2 4,523,098
551 4,523,099
561 4,523,100
578 4,523,101
4,523,102

CLASS 251

1 B 4,522,368
61.5 4,522,369
63.5 4,522,370
139 4,522,371
141 4,522,372
297 4,522,373
356 4,522,374

CLASS 252

8.55 D 4,522,732
8.55 R 4,522,731
49.3 4,522,733
49.6 4,522,734
49.9 4,522,735
51.5 A 4,522,736
62.2 4,522,737
90 4,522,738
95 4,522,739
174.21 4,522,740
299.63 4,522,741
301.16 4,522,742
311 4,522,743
478 4,522,744
500 4,522,745
4,522,746
511 4,522,747
522 R 4,522,748
4,522,749

CLASS 254

425 4,522,375

CLASS 260

112 B 4,522,751
112 R 4,522,750
112.5 R 4,522,752
123.7 4,522,753
239 R 4,522,754
245.75 4,522,755
349 4,522,756
396 R 4,522,757
397.5 4,522,758
404 4,522,759
410.9 R 4,522,760
419 4,522,761
453 A 4,522,762
455 A 4,522,763
456 R 4,522,764
463 4,522,765

CLASS 261

91 4,522,766
94 4,522,767

CLASS 264

0.5 4,522,769
2.2 4,522,768
36 4,522,770
61 4,522,771
71 4,522,772
167 4,522,773
168 4,522,774
173 4,522,775
176 R 4,522,776
223 4,522,777
328.7 4,522,778
530 4,522,779

CLASS 266

47 4,522,376
196 4,522,377

CLASS 267

141.4 4,522,378

CLASS 269

47 4,522,379
71 4,522,380
328 4,522,381

CLASS 270

1.1 4,522,382
53 4,522,383
54 4,522,384

CLASS 271

10 4,522,385
147 4,522,386
187 4,522,387
245 4,522,388

CLASS 272

4 4,522,389
29 4,522,390
62 4,522,391
142 4,522,392

CLASS 273

1 GF 4,522,393
1.5 R 4,522,394
30 4,522,395
58 K 4,522,396
63 D 4,522,397
84 R 4,522,398
143 R 4,522,399
148 A 4,522,400
153 S 4,522,401
4,522,402
154 4,522,403
157 R 4,522,404
167 A 4,522,405
197 A 4,522,406
256 4,522,407
271 4,522,408
316 4,522,409

CLASS 277

47 4,522,328
56 4,522,410
134 4,522,411
138 4,522,412
205 4,522,413
212 R 4,522,414
216 4,522,415

CLASS 280

91 4,522,416
4,522,417
95 A 4,522,418
96 4,522,419
289 A 4,522,420
511 4,522,421
617 4,522,422
624 4,522,423
633 4,522,424
656 4,522,425
808 4,522,426

CLASS 281

5 4,522,427

CLASS 283

82 4,522,428
91 4,522,429

CLASS 285

24 4,522,430
27 4,522,431
55 4,522,432
93 4,522,433
112 4,522,434
256 4,522,435

CLASS 292

113 4,522,436

CLASS 294

9 4,522,437
19.2 4,522,438
110.1 4,522,439

CLASS 296

37.1 4,522,442
100 4,522,440
160 4,522,441

CLASS 297

157 4,522,443
239 4,522,444
284 4,522,445
377 4,522,446
452 4,522,447

CLASS 299

13 4,522,448

CLASS 303

9 4,522,450

CLASS 305

18 4,522,451
43 4,522,452

CLASS 307

141 4,523,103
247 A 4,523,104
261 4,523,105
303 4,523,106
352 4,523,107
353 4,523,108
520 4,523,109
530 4,523,110
574 4,523,111

CLASS 308

3 R 4,522,453
4,522,454

CLASS 310

10 4,523,112
11 4,523,113
24 4,523,114
50 4,523,115
71 4,523,116
4,523,117
90 4,523,118
313 A 4,523,119
323 4,523,120
334 4,523,121
4,523,122

CLASS 313

412 4,523,123
446 4,523,124
491 4,523,125
594 4,523,126

CLASS 315

4 4,523,127
291 4,523,128
4,523,129
4,523,130
307 4,523,131
321 4,523,132

CLASS 318

7 4,523,133
313 4,523,134
565 4,523,135
568 4,523,136
604 4,523,137
685 4,523,138

CLASS 320

40 4,523,139

CLASS 323

315 4,523,140

CLASS 324

54 4,523,141
65 R 4,523,142
133 4,523,143
158 F 4,523,145
158 P 4,523,144
204 4,523,146
248 4,523,147
351 4,523,148
377 4,523,149

CLASS 328

133 4,523,150

CLASS 329

124 4,523,151

CLASS 330

151 4,523,152
254 4,523,153
266 4,523,154
279 4,523,155
282 4,523,156

CLASS 331

4 4,523,157
55 4,523,158
99 4,523,159

CLASS 333

21 A 4,523,160
81 R 4,523,161
202 4,523,162
218 4,523,163

CLASS 335

38 4,523,164
106 4,523,165
216 4,523,166
230 4,523,167
296 4,523,168

CLASS 336

60 4,523,169
83 4,523,170
96 4,523,171

CLASS 337

164 4,523,172
367 4,523,173

CLASS 338

119 4,523,174
134 4,523,175
179 4,523,176
303 4,523,177

CLASS 339

14 R 4,522,455
17 R 4,522,456
30 4,522,457
45 M 4,522,458
98 4,522,459
99 R 4,522,460

CLASS 340

64 4,523,178
347 AD 4,523,180
347 DA 4,523,179
4,523,182
347 DD 4,523,181
507 4,523,183
524 4,523,185
539 4,523,184
555 4,523,186
661 4,523,187
734 4,523,188
781 4,523,189
825.03 4,523,190
825.52 4,523,191
825.57 4,523,192
825.69 4,523,193
856 4,523,194
870.37 4,523,195

CLASS 343

17.7 4,523,196
702 4,523,197
754 4,523,198

CLASS 346

1.1 4,523,199
4,523,200
4,523,201
75 4,523,202
76 PH 4,523,203
107 B 4,523,204
208 4,523,205
214 4,523,207
4,523,208

CLASS 350

96.18 4,522,461
96.19 4,522,462
96.21 4,522,463
96.23 4,522,464
96.30 4,522,465
162.12 4,522,466
263 4,522,467

332 4,522,468
342 4,522,469
350 R 4,522,470
362 4,522,472
377 4,522,473
449 4,522,471

CLASS 351

203 4,522,474

CLASS 352

39 4,522,475
225 4,522,476

CLASS 354

173.1 4,522,477
288 4,522,478
413 4,522,479
468 4,522,480

CLASS 355

3 DD 4,522,481
4,522,484
3 R 4,522,482
4,522,483
11 4,522,485
14 SH 4,522,486
15 4,522,487
4,522,488
73 4,522,489
75 4,522,490
77 4,522,491

CLASS 356

1 4,522,492
36 4,522,493
39 4,522,494
345 4,522,495
350 4,522,496
431 4,522,497

CLASS 357

4 4,523,211
17 4,523,212
23.7 4,523,213
30 4,523,214
40 4,523,215
42 4,523,216
43 4,523,217
70 4,523,218
79 4,523,219

CLASS 358

12 4,523,220
21 R 4,523,221
27 4,523,222
4,523,223
42 4,523,224
56 4,523,225
88 4,523,226
105 4,523,227
120 4,523,228
139 4,523,231
163 4,523,229
167 4,523,230
236 4,523,232
242 4,523,233
256 4,523,235
293 4,523,234
341 4,523,236

CLASS 360

8 4,523,237
46 4,523,238
74.1 4,523,239
99 4,523,240
105 4,523,241
109 4,523,242
113 4,523,243
129 4,523,244
130.21 4,523,245
133 4,523,246
137 4,523,247

CLASS 361

1 4,523,248
58 4,523,249
145 4,523,250
152 4,523,251
212 4,523,252
335 4,523,253
391 4,523,254
407 4,522,449
433 4,523,255

CLASS 362

11 4,523,256
32 4,523,257
108 4,523,258
120 4,523,259
121 4,523,260
192 4,523,261
214 4,523,262
267 4,523,263
396 4,523,264

CLASS 363

21 4,523,265
26 4,523,266
87 4,523,267
98 4,523,268
138 4,523,269

CLASS 364

191 4,523,270
200 4,523,206
4,523,271
4,523,272
4,523,273
4,523,274
4,523,275
4,523,276
4,523,277
413 4,523,278
416 4,523,279
424 4,523,280
424.1 4,523,281
426 4,523,282
431.01 4,523,283
431.12 4,523,284
469 4,523,209
479 4,523,285
494 4,523,286
513 4,523,287
551 B1 3,602,706
569 4,523,288
4,523,289
602 4,523,290
724 4,523,291
760 4,523,210
786 4,523,292
821 4,523,293
900 4,523,294
4,523,295
4,523,296
4,523,297
4,523,298
4,523,299

CLASS 365

43 4,523,300
49 4,523,301
195 4,523,302

CLASS 366

4 4,522,498
56 4,522,499
113 4,522,500
142 4,522,501
160 4,522,502
287 4,522,503
339 4,522,504
343 4,522,505

CLASS 367

20 4,523,303

CLASS 368

75 4,522,506
157 4,522,507
276 4,522,508
300 4,522,509

CLASS 369

32 4,523,304
33 4,523,305
77.1 4,523,306

CLASS 370

30 4,523,307
56 4,523,308
69.1 4,523,311
81 4,523,309
112 4,523,310

CLASS 371

1 4,523,312
10 4,523,313
38 4,523,314

CLASS 372

3 4,523,315
45 4,523,316
4,523,317
48 4,523,318
54 4,523,319
87 4,523,320

CLASS 373

110 4,523,321

CLASS 374

7 4,522,510
32 4,522,511
44 4,522,512

CLASS 375

36 4,523,322
37 4,523,323
91 4,523,324

CLASS 376

260 4,522,780
427 4,522,781
438 4,522,782

CLASS 377

44 4,523,325
58 4,523,326

CLASS 378

124 4,523,327

CLASS 381

3 4,523,328
4,523,329

CLASS 382

7 4,523,330
18 4,523,331

CLASS 384

368 4,522,513
569 4,522,514
571 4,522,515
572 4,522,516

CLASS 400

322 4,522,517
486 4,522,518
624 4,522,519
636.1 4,522,520
691 4,522,521

CLASS 401

88 4,522,522
126 4,522,523
183 4,522,524
258 4,522,525

CLASS 402

37 4,522,526

CLASS 403

49 4,522,527
61 4,522,528
343 4,522,529

CLASS 404

2 4,522,531
10 4,522,530

CLASS 405

11 4,522,532
36 4,522,533
37 4,522,534
79 4,522,535
168 4,522,536
288 4,522,537

CLASS 407

35 4,522,538

CLASS 408

72 R 4,522,539

CLASS 409

293 4,522,540

CLASS 411

103 B1 4,285,380
554 4,522,541

CLASS 412

25 4,522,542

CLASS 414

9 4,522,543
330 4,522,544
343 4,522,546
376 4,522,545
391 4,522,547
458 4,522,548
474 4,522,549
498 4,522,550
517 4,522,551
523 4,522,552
526 4,522,553
686 4,522,554
733 4,522,555
786 4,522,556

CLASS 415

115 4,522,557
196 4,522,559
210 4,522,560

CLASS 416

11 4,522,561
95 4,522,562
134 A 4,522,563
140 4,522,564
187 4,522,558

CLASS 417

220 4,522,565
222 4,522,566
270 4,522,567
307 4,522,568
434 4,522,569
475 4,522,570
476 4,522,571

CLASS 418

23 4,522,573
55 4,522,574
4,522,575
194 4,522,576

CLASS 420

503 4,522,783
590 4,522,784

CLASS 422

12 4,522,785
56 4,522,786
78 4,522,787
4,522,788
133 4,522,789
246 4,522,790
249 4,522,791
267 Re.31,913

CLASS 423

213.5 4,522,792
230 4,522,793
251 4,522,794
300 4,522,795
4,522,796
4,522,797
4,522,798
306 4,522,799
329 4,522,800
447.4 4,522,801
652 4,522,802

CLASS 424

1.1 4,522,803
19 4,522,804
52 4,522,805
4,522,806
59 4,522,807
4,522,808
89 4,522,809
4,522,810
177 4,522,813
288 4,522,820

CLASS 425

6 4,522,577
110 4,522,578
126 R 4,522,579
193 4,522,580
534 4,522,581

CLASS 426

20 4,522,832
93 4,522,833
231 4,522,834
264 4,522,835
271 4,522,836
482 4,522,837
537 4,522,838
548 4,522,839

CLASS 427

3 4,522,840
4 4,522,841
8 4,522,842
27 4,522,843
38 4,522,844
53.1 4,522,845
54.1 4,522,846
55 4,522,847
131 4,522,848
237 4,522,849
304 4,522,850
386 4,522,851

CLASS 428

36 4,522,852
40 4,522,853
43 4,522,854
49 4,522,855
64 4,522,856
95 4,522,857
96 4,522,858
116 4,522,859
132 4,522,860
192 4,522,861
195 4,522,862
196 4,522,863
201 4,522,864
212 4,522,865
216 4,522,866
220 4,522,867
224 4,522,868
245 4,522,869
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257 4,522,872
283 4,522,873
284 4,522,874
285 4,522,875
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304.4 4,522,877
313.7 4,522,878
323 4,522,879
332 4,522,880
336 4,522,881
351 4,522,882
365 4,522,883
400 4,522,884
422 4,522,885
446 4,522,886
461 4,522,887
546 4,522,888
614 4,522,889
624 4,522,890
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628 4,522,892
641 4,522,893

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17 4,522,894
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63 4,522,896
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194 4,522,901
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114 4,522,908
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278 4,522,912
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564 4,522,917

CLASS 431

123 4,522,582
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253 4,522,584
344 4,522,585

CLASS 432

11 4,522,586
114 4,522,587
181 4,522,588
239 4,522,589

CLASS 433

15 4,522,590
60 4,522,591
95 4,522,592
136 4,522,593
141 4,522,594
142 4,522,595
173 4,522,596
216 4,522,597

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259 4,522,598
339 4,522,599

CLASS 435

68 4,522,918
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CLASS 436

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500 4,522,922
536 4,522,923

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11 4,522,601
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433 4,522,606
447 4,522,607

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CLASS 464

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162 4,522,611
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260 4,522,614

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143 4,522,618
415 4,522,619

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15 4,522,925
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139 4,522,927

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302 4,522,937
307 4,522,938
328 4,522,940
333 4,522,941

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34 4,522,815
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54 4,522,814
95 4,522,817
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187 4,522,819
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517 4,522,825
569 4,522,826
646 4,522,828
652 4,522,829
671 4,522,827
690 4,522,830

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335 4,522,959
339 4,522,960
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510 4,522,963

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109 4,522,965
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377 4,522,967
388 4,522,968
425 4,522,969
447 4,522,970
547 4,522,971
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555 4,522,973
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702 4,522,975
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415 4,522,984
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410		4,523,021
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454		4,523,036
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CLASS 720		
316		4,522,053

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	223	279,136
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	310	279,139
	361	279,140
	385	279,141
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		279,144
	75	279,145
D6—	309	279,146
	422	279,147
	432	279,148
	444	279,149
	462	279,150
	491	279,151
	501	279,152
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	57	279,159
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	393	279,161
	412	279,162
D8—	25	279,163
	354	279,164
		279,165
D9—	300	279,166
	378	279,167
	429	279,168
	447	279,169
	456	279,170
D10—	9	279,171
	32	279,172
	40	279,173
D11—	47	279,174
	164	279,175
D12—	112	279,176
	136	279,177
	151	279,178
	162	279,179
	211	279,180
D13—	5	279,181
D14—	1	279,182
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	57	279,184
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		279,190
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	113	279,189
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D16—	132	279,193
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D18—	2	279,196
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	19	279,198
	30	279,199
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	127	279,205
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	234	279,208
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	25	279,213
	72	279,214
	146	279,215
	148	279,216
D24—	17	279,217
	46	279,218
	62	279,219
D25—	2	279,220
D26—	44	279,221
		279,222
	60	279,223
D28—	7	279,224
	83	279,225
D32—	1	279,226
	31	279,227
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4,522,072	4,522,362	4,522,948	4,522,091	4,522,856	18 : 4,521,954
4,522,222	4,522,365	4,522,985	4,522,247	4,522,857	4,521,955
4,522,239	4,522,381	4,523,017	4,522,285	4,522,863	4,521,956
4,522,242	4,522,385	4,523,029	4,522,327	4,523,228	4,521,984
4,522,612	4,522,386	4,523,040	4,522,472	4,523,258	4,522,031
4,523,057	4,522,391	4,523,061	4,522,495	16 : 4,522,083	4,522,160
04 : 4,521,974	4,522,401	4,523,065	4,522,519	4,522,517	4,522,651
4,521,988	4,522,425	4,523,067	4,522,579	4,523,060	4,522,659
4,522,088	4,522,457	4,523,071	4,522,618	17 : 4,521,934	4,522,750
4,522,420	4,522,469	4,523,080	4,522,692	4,521,938	4,522,758
4,522,537	4,522,476	4,523,084	4,522,762	4,521,948	4,522,799
4,522,558	4,522,490	4,523,093	4,522,790	4,521,997	4,522,914
4,522,619	4,522,496	4,523,100	4,522,802	4,522,006	4,522,919
05 : 4,522,255	4,522,510	4,523,127	4,522,819	4,522,017	4,522,980
06 : Re.31,912	4,522,530	4,523,137	4,522,956	4,522,090	4,523,058
4,521,970	4,522,532	4,523,156	4,522,969	4,522,117	4,523,118
4,521,979	4,522,586	4,523,178	4,522,973	4,522,136	4,523,146
4,521,982	4,522,590	4,523,179	4,522,975	4,522,162	4,523,169
4,521,990	4,522,592	4,523,182	4,523,055	4,522,320	4,523,233
4,521,992	4,522,594	4,523,185	4,523,079	4,522,336	4,523,259
4,522,000	4,522,598	4,523,206	4,523,120	4,522,361	4,523,273
4,522,056	4,522,606	4,523,226	4,523,199	4,522,371	19 : 4,522,071
4,522,089	4,522,607	4,523,240	4,523,200	4,522,378	4,522,109
4,522,103	4,522,622	4,523,279	4,523,201	4,522,384	4,522,267
4,522,106	4,522,625	4,523,290	4,523,331	4,522,403	4,522,452
4,522,119	4,522,639	4,523,293	10 : 4,522,645	4,522,411	4,522,505
4,522,141	4,522,642	4,523,299	4,522,686	4,522,441	4,522,553
4,522,146	4,522,644	4,523,300	4,522,786	4,522,454	4,522,715
4,522,150	4,522,647	4,523,302	4,522,971	4,522,465	20 : 4,522,098
4,522,154	4,522,661	4,523,305	4,522,990	4,522,732	4,522,191
4,522,185	4,522,662	4,523,311	4,522,995	4,522,761	4,522,211
4,522,193	4,522,673	4,523,319	4,523,010	4,522,775	4,522,233
4,522,196	4,522,682	4,523,320	4,523,082	4,522,785	4,522,248
4,522,200	4,522,697	4,523,325	11 : 4,522,494	4,522,789	4,522,396
4,522,207	4,522,698	4,523,326	12 : 4,522,002	4,522,792	4,522,545
4,522,221	4,522,711	4,523,327	4,522,145	4,522,831	4,522,570
4,522,227	4,522,728	4,285,380	4,522,366	4,522,890	4,522,580
4,522,232	4,522,745	08 : 4,521,975	4,522,421	4,522,935	4,522,582
4,522,238	4,522,756	4,522,085	4,522,437	4,522,937	4,523,114
4,522,241	4,522,810	4,522,099	4,522,726	4,523,020	21 : 4,522,190
4,522,265	4,522,811	4,522,433	4,522,830	4,523,045	4,522,245
4,522,271	4,522,814	4,522,486	4,522,877	4,523,048	4,523,069
4,522,275	4,522,835	4,522,572	4,522,900	4,523,062	22 : 4,521,965
4,522,277	4,522,838	4,522,578	4,522,922	4,523,066	4,522,258
4,522,280	4,522,844	4,522,804	4,523,087	4,523,091	4,522,264
4,522,303	4,522,845	4,523,140	4,523,263	4,523,128	4,522,536
4,522,308	4,522,846	4,523,183	4,523,264	4,523,155	4,522,630
4,522,313	4,522,848	4,523,203	4,523,308	4,523,159	4,522,704
4,522,325	4,522,859	4,523,243	4,523,310	4,523,193	4,522,706
4,522,333	4,522,864	4,523,254	13 : 4,521,957	4,523,250	4,522,795
4,522,339	4,522,883	4,523,277	4,521,962	4,523,267	4,522,796
4,522,356	4,522,910	09 : 4,521,981	4,522,105	4,523,280	4,522,797

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